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2017/18 GHANA CENSUS OF AGRICULTURE

National Report



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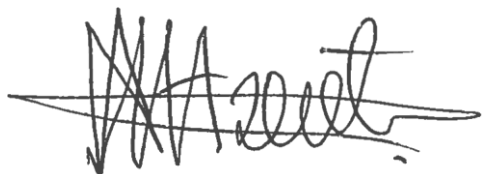
FOREWORD

The 2017/18 Ghana Census of Agriculture (GCA) is the fourth census of agriculture carried out in the country. Earlier agricultural censuses were conducted in 1950, 1970 and 1984/85. Unlike the previous censuses, the 2017/18 GCA was an electronic census that deployed tablets and the Computer Assisted Personal Interview (CAPI) technique to collect nationwide information on households and institutions engaged in agricultural activities.

The GCA provides benchmark data for planning and monitoring the national development agenda-the Coordinated Programme of Economic and Social Development Policies 2017-2024 and the Medium-Term National Development Policy Framework 2018-2021. The census will help policymakers set targets to assess progress towards the attainment of the Sustainable Development Goals (SDGs) and the African Union Agenda 2063. Additionally, the GCA will enhance the understanding of the effectiveness of the various agricultural interventions and other national policy initiatives, such as the "Planting for Food and Jobs" with its five modules by government and development partners to improve the livelihood of citizens and ensure food security for the country.

This census was a collaboration between the Ghana Statistical Service and the Ministry of Food and Agriculture. The data collection consisted of two broad phases. Phase **one**- the Listing Phase -entailed listing of all structures to identify all agricultural households and institutions. Phase two consisted of the administration of the core and community modules, and the collection of data on all agricultural households and institutions identified in Phase one. Appropriate statistical procedures and controls were put in place during the data collection to ensure that data from the census are of high quality.

This report contains the findings of the core module, which include background characteristics of agricultural holders (households and institutions), as well as the agricultural activities of holders who are engaged in arable and tree crop farming, livestock rearing, bee-keeping, fish farming, tree planting, and other agriculture-related activities. It provides detailed analysis on key agricultural indicators, such as the youth in agriculture, educational level of agricultural holders, type of cropping system being practised, type of tenure agreement of land used in agricultural production, the use of fertilizer, pesticide, irrigation and the use of protective cover in crop production, purpose of production, quantity produced, quantity sold, cost of production and land area under cultivation for each crop type.



HON. DR. OWUSU AFRIYIE AKOTO
MINISTER FOR FOOD AND
AGRICULTURE

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We acknowledge with thanks the support of the Ministry of Finance; the Ministry of Communications; the Ministry of Information; the Ministry of Fisheries and Aquaculture Development; and the Ministry of Trade and Industry. In addition, sincere thanks and acknowledgement are extended to the Ministry of Local Government and Rural Development; the Ministry of Lands, Mines and Natural Resources; the Ministry of Gender, Children and Social Protection as well as the Regional and District Management Committees of the GCA.

The Management of GSS is grateful for the exemplary and inspiring leadership provided by the National Steering Committee and in particular the Minister for Food and Agriculture, Honourable Dr. Owusu Afriyie Akoto, the Chairman of the Steering Committee and his co-chair, Honourable Vincent Sowah Odotei (MP) and Deputy Minister for Communications. The passion and technical support provided by the GSS Board made an indelible impact in ensuring the successful conduct of the GCA.

Finally, we wish to acknowledge with gratitude the contribution of all the field officers who worked under challenging conditions to collect the required information from households and institutions across the country.



PROF. SAMUEL K. ANNIM
GOVERNMENT
STATISTICIAN

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ACRONYMS

AEZ	Agro-Ecological Zones
CAPI	Computer-Assisted Personal Interview
CSIR	Council for Scientific and Industrial Research
CSPro	Census and Survey Processing System
DFID	Department for International Development
DP/IT	Data Processing/Information Technology
EA	Enumeration Areas
FAO	Food and Agriculture Organisation
FASDEP	Food and Agriculture Sector Development Policy
GASIP	Ghana Agricultural Sector Investment Programme
GCA	Ghana Census of Agriculture
GDP	Gross Domestic Product
GPS	Global Positioning System
GSS	Ghana Statistical Service
ISD	Information Services Department
ISSER	Institute of Statistical, Social and Economic Research
MDAs	Ministries, Departments and Agencies
METASIP	Medium Term Agricultural Sector Investment Plan
METSS	Monitoring, Evaluation and Technical Support Services
MMDAs	Metropolitan, Municipal and District Assemblies
MoFA	Ministry of Food and Agriculture
MP	Member of Parliament
MTs	Metric Tonnes
NDPC	National Development Planning Commission
NSC	National Steering Committee
NTC	National Technical Committee
PWD	Person With Disability
SDGs	Sustainable Development Goals
ToT	Training of Trainers
UN	United Nations
USAID	United States Agency for International Development
WB	World Bank

GLOSSARY

Agricultural activity: Agricultural activities include the cultivation of arable crops, tree crops, forest trees and the rearing of livestock, aquaculture and capture fisheries.

Agricultural household: A household with at least one of its members engaged in an agricultural activity.

Agricultural land: This is defined as the sum of arable land, land under permanent crops and land under permanent pastures.

Agricultural institution: An institution engaged in an agricultural activity.

Agriculture: The production of plants and animals, including fresh water and marine species, for food, fuel, fibre or medicine.

Agro-ecological zones: Geographical areas exhibiting similar soil and climatic conditions that support rain-fed agriculture.

Aquaculture: The farming of fish. The farming refers to some intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators.

Arable crops: Crops that mature within a short period, usually less than one year. Examples of arable crops are plantain, cocoyam, cassava, yam, etc.

Arable land: refers to all land generally under rotation whether it is under temporary crops, left temporary fallow or used as temporary pastures.

Bee-keeping (apiculture): The culturing of bees to produce honey.

Capture fisheries: Fishing in the wild, from marine and inland waters.

Domestic only forest trees: Species with very low export demand and are mostly sold on the domestic market.

Enumeration area (EA): A small geographic area that one census officer is expected to cover in data collection within the specified period allotted for the census exercise.

Export and domestic forest trees: Species that have export value but are also commonly found on the domestic market.

Export only forest trees: Species with high export demand and are mostly exported.

Field: A piece of land in a parcel separated from the rest of the parcels by easily recognisable demarcation lines, such as paths, cadastral boundaries and/or hedges. A field may consist of one or more plots.

Fish landing: Total catch in a fishing trip brought ashore.

Fishing gear: Materials, including nets, used in harvesting fish.

Fishing trip: A roundtrip fishing expedition by a canoe or semi-industrial vessel, being the time the canoe or fishing vessel departs from shore until its return to shore.

Forest tree planting: The growing of trees for the purpose of afforestation or production of wood.

Free use of vessels: Capture fisheries holders who freely use vessels belonging to relatives or friends for fishing trips.

Freehold : This is a type of tenure which involves the holding of registered land in perpetuity or for a period less than perpetuity which may be fixed by a condition, that is owning a piece of land for a period of time that is not limited.

Gears/nets: Materials used in harvesting fish.

Grow-out: The production unit in which fish fingerlings are raised to adult size for sale.

Hatchery: The production unit in which fish eggs are hatched and raised to fingerlings.

Head of household: A member of the household who takes general responsibility for the up-keep, wellbeing and security of the household and is recognised and acknowledged by the other household members as such.

Holder: Agricultural holder (Farm owner) is a person who takes the major decisions regarding resource use and exercises management control over the holding.

Household: A person or group of persons who normally live together and are catered for as one unit. Members of the household may or may not be related.

Inheritance: It is the practice of passing property, title, debt, right and obligation of the death of an individual land received by members of collective holding for individual use

Institution: A non-household entity engaged in commercial or non-commercial agricultural activities.

Integrated system of production: An aquaculture production system that uses livestock droppings as feed for the fingerlings.

Land tenure: The relationship, whether legally or customarily defined, among individuals or groups that define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. (FAO).

Large-scale farming: Land area greater than or equal to 5 acres for arable crops and greater than or equal to 10 acres for tree crops.

Leasehold: A piece of land that can be used for a limited period of time according to the arrangement in the lease.

Literacy: Ability to read and write in any language with understanding.

Livestock: Animals reared for food, commercial or other agricultural purposes such as cattle, sheep, goats, pigs and poultry. It excludes domestic animals, such as cats and dogs, unless raised for such purposes.

Locality: A distinct population cluster (also designated as inhabited place, populated centre, settlement) which has a NAME or LOCALLY RECOGNISED STATUS. It includes fishing hamlets, mining camps, ranches, farms, market towns, villages, towns, cities and many other types of population clusters, which meet the above criteria.

Marketing of agriculture produce: The selling of agriculture produce.

Mass media: Communication that is to a large group or groups of people in a short time, for example, newspapers, magazines, radio, advertisement, social media, TV, internet and films.

Medium-scale farming: Land area greater than 2 acres but less than 5 acres for arable crops and greater than 5 acres but less than 10 acres for tree crops

Mixed-cropping: The growing of two or more different crops on the same parcel of land.

Mono-cropping: The cultivation of a single crop at a time on a parcel of land.

Mono-culture: An aquaculture production system in which one type of fish is reared at a time in a production facility.

Non-ruminants: Animals which have single compartment stomach such as the horse, donkey, mule, local or exotic pig, dog and cat.

Non-traditional livestock: Livestock such as snail, grasscutter, rabbits and honey bees not commonly reared.

Parcel of land: A piece of land under one land tenure arrangements, entirely surrounded by features such as other land (not under the same land tenure arrangement), water, road, or forest. A parcel may consist of one or more fields or plots adjacent to each other.

Plot: The section of a parcel or field used for cultivating a specific crop or a mix of crops.

Polyculture: An aquaculture production system in which more than one type of fish are reared together at a time in a facility.

Poultry: Domestic fowls including birds, chicken, turkey, duck, guinea fowls, geese raised for the production of meat or egg.

Premix fuel: Special fuel for outboard motor engines.

Processing of agriculture produce: The transformation of agriculture produce into other forms of food and materials, for example, converting cassava to gari, cotton to yarn, oil-palm to palm oil, etc.

Promoted forest trees: Species not commonly known on the market and whose use is being encouraged by the Forestry Commission.

Protected forest trees: Endangered species (availability near extinction) and whose harvest is regulated by law.

Relationship to head: Persons are related either by blood, marriage or by legal means. Examples of blood relations are son/daughters, Parents, Sisters/Brothers, etc.

Respondent: This is the person from whom information is being obtained, e.g., head of the household or any adult member (15 years or older) of the household.

Ruminants: Animals that have four chambered stomachs and ruminate or chew the cud. Examples include the cattle, sheep and goats.

Semi-industrial vessel: Small and medium sized fishing vessels fitted out with mechanised method of operating the fishing gear without refrigeration.

Share-cropping: A system of land-use arrangement that functions in two main prominent ways, namely, abunu and abusa. Abunu: the completed farmland is physically divided into two with the tenant and the landlord taking equal shares of the harvest or the cropped land. Abusa: the proceeds of the land are shared in the ratio of 1:2 with the landlord taking one part and the tenant two-thirds.

Small-scale: Land area of sizes that are less than 2 acres for arable crops and less than or equal to 5 acres for tree crops.

Squatting: The practice where a holder is using a parcel of private or public land without any clear ownership and/or permission of the owner.

Structure: A separate and independent building or an enclosure, either completed or uncompleted with a roof and walls and may be permanent or movable. It can be constructed with different materials such as concrete, brick, mud, metal, plastic, cardboard, wood, glass, grass, straw and bamboo. Some examples of a structure are; house, factory, school, church, mosque, office, hotel, store, supper-market, kiosk, container, etc.

Tree crops: Crops that are cultivated for two or more years for fruits, without the need for replanting each year (e.g., mangoes, pears, etc.).

Trusteeship: A situation in which someone's land or property is managed by another person or organisation on behalf of the owner.

EXECUTIVE SUMMARY

The Ghana Census of Agriculture (GCA), 2017/18 has revealed that agricultural activities in the country still remains rural and rudimentary with little innovation and modernisation. Most agricultural holders use traditional tools and equipment for production whereas the use of modern tools and equipment such as tractors, shellers, power tillers, hatchery/incubator, meat processing equipment and milking equipment are negligible. While fertilizer is not used by most holders, the use of pesticides is highly prevalent among holders. Crop cultivation is predominantly dependent on rain and mortality in livestock is high. The Sector, is characterised by the consumption of own produce. Agriculture production is largely small-scale with the majority of parcels of land used for the cultivation of crops smaller than 2 acres. The level of education among agricultural holders is low with males dominating the sector. In addition to this, the youth, generally, find agribusiness unattractive.

Background

The 2017/18 GCA is the fourth to be conducted since 1950. The second census was conducted in 1970, 20 years after the initial GCA, and the third occurred 15 years later in 1985. Carried out 33 years after the third census of agriculture, the 2017/18 GCA was the first to include agricultural institutions. The 2017/18 GCA was also the first electronic census where the Computer-Assisted Personal Interview (CAPI) technique was deployed in the collection of data on households and institutions engaged in agricultural activities nationwide.

The data collection consisted of two broad phases. Phase one involved the listing of structures, households and institutions to identify households and institutions engaged in agriculture. The second phase involved the administration of the core and community modules and collected information on the characteristics of holders and holdings of individuals and institutions, and their agricultural activities. The agricultural activities covered are the cultivation of arable crops, tree crops and forest trees, as well as livestock rearing, aquaculture and fish capturing.

Questionnaires for the survey were developed following the Food and Agriculture Organisation (FAO) guidelines issued for the 2020 Round of Agricultural Censuses and were administered using the face-to-face interview technique.

Findings

Persons engaged

A total of 4,864,276 households were identified during the listing exercise (GSS, 2018; p. 31) of which 2,585,531 were agricultural households¹. A total of 3,037,381 persons 15 years or older are engaged in agriculture of which 65.8 percent are males and 76.6 percent are in rural areas. The

¹ Households enumerated during the listing were 2,568,146. The difference, among other reasons, was due to reclassification of some agricultural institutions to households and identification of new agricultural households during the administration of the core modules

youth (15-35 years) constitute 29.7 percent of persons engaged. There are 45,538 persons engaged in agriculture who have some form of disability. Nine in ten of persons aged 15 years or older engaged in agriculture have either never attended school or only attained basic education, with close to half (46.9%) having never attended school.

Holders

The total number of agricultural holders is 2,158,697 of which about a quarter (519,788) are youth. Agricultural holders are mostly males, which is about 2.6 times as high (1,551,265) as females (607,432). There are 24,438 holders aged 15 years or older with some form of disability and physical disability being the most common. About 87 percent of agricultural holders have either basic education (44.0%) or no formal education (43.1%). Majority of females (52.6%) have never attended school. Seven in ten persons engaged in agriculture are holders with higher proportion of males than females.

Institutions

A total of 16,919 institutions are engaged in agriculture of which, 62.9 percent are in rural areas. The institutions engage 380,248 persons who are directly involved in agricultural activities of which 63.7 percent (242,076) are males and 74.9 percent are in rural areas.

Agricultural activities

In Ghana, agricultural activities, for both households and institutions, are mostly the cultivation of arable and tree crops, and livestock rearing. Three in ten (30.2%) of persons aged 15 years or older in agricultural households and 11.8 percent of agricultural institutions are engaged in at least two different agricultural activities. Furthermore, about two-thirds (65.7%) of holders in agricultural households mainly cultivate arable crops, close to a third (30.9%) grow tree crops and only 3.0 percent are engaged in livestock rearing. The proportion of agricultural institutions cultivating arable crops is 60.9 percent, tree crops 29.7 percent and livestock rearing 19.3 percent. Agricultural activities of both households and institutions are predominantly rural.

Agricultural practices

The most common type of land tenure arrangement used by both male and female holders in both urban and rural areas for the production of crops and forest trees is ownership through either freehold (52.2%) or inheritance (23.0%) which together constitute 75.2 percent of all parcels. For institutions, ownership through freehold (64.0%) and inheritance (11.3%) constitute 75.3 percent of the type of land tenure arrangements. However, most holders including institutions do not have any documentation covering the land tenure arrangements. Only 12.9 percent of land parcels used for crop and forest tree production by households and 33.7 percent by institutions have complete documentation. More than half (56.7%) of land parcels used for the production of crops and forest trees are small (less than 2 acres), with a higher proportion (71.4%) of parcels belonging to females being less than 2 acres. Six in ten (59.4%) of all arable crops are produced on land parcels less than 2 acres and one quarter (24.5%) are on parcels that are greater than 2 but less than 5 acres. However, parcels used for cultivating forest trees are much larger in size. More than half (51.4%) of the parcels for forest tree cultivation by households are 10 acres or larger of which 72.0 percent are 20 acres or larger. In the case of institutions, 59.7 percent of forest trees is cultivated on parcels 50 acres or more.

Three tree crops (cocoa, cashew and oil-palm) account for 95.0 percent of total land under the cultivation of tree crops. Land parcels used in the cultivation of tree crops are larger in size than arable crops. A third (35.7%) of parcels used by households for the cultivation of tree crops are less than 2 acres. A similar pattern is observed for institutions with a higher proportion of land parcels greater than 20 acres.

Knapsack sprayers are the most common (about three-quarters) modern agriculture equipment used by both households (73.0%) and institutions (74.2%). The use of tractors by households (24.7%) and mist blowers (22.0%) are less common. A similar patterns is observed for institutions where use of tractors is 21.1 percent and mist blowers is 21.7 percent. Pesticides are commonly used relative to fertilizer and irrigation.

Production and sale — households in agriculture

A total of 29,019,363 metric tonnes (mts) of arable crops were produced of which 94.4 percent are staple starchy crops. More than three-quarters of the quantity produced were sold. The total quantity of tree crops produced was 4,316,450 mts with oil-palm and cocoa accounting for 68.6 percent of this output and 87.6 percent of the total tree crops produced was sold.

A total of 57,220,809 forest trees were grown. Species classified as “Export and Domestic” have the highest number (10,671,632) of forest trees grown. Most forest tree holders (nine in ten) are in rural areas and the most common species grown is acacia (75.0%) followed distantly, by teak (9.2%), ofram (3.2%) and neem tree (2.0%).

The livestock population was 17,709,547 with poultry forming the highest proportion (73.9%) followed distantly, by ruminants (21.2%). The livestock off-take constitutes 45.0 percent of the population. Six in ten (58.6%) of the quantity of livestock produced was sold. Half (50.1%) of the off-take constituted sales and 27.1 percent death. About 210,599 mts of meat, 403,730,608 litres of milk and 29,550,479 crates of eggs were produced.

Aquaculture is dominated by large-scale production, accounting for 81.9 percent of total quantity produced. Fish cultured was predominantly tilapia representing 99.8 percent of total quantity produced. Two-fifth (39.0%) of total production was sold with higher proportion of sales of production (59.9%) from small-scale compared to 33.8 percent of large-scale production that was sold.

Most holders (90.6%) of capture fisheries are engaged in inland fishing, however, their output accounted for only about 20.2 percent of total fish landed. For marine fishing, five species accounted for 75.5 percent of total landings. Six in ten (62.8%) of fish landed was sold. Furthermore, a higher proportion of fish that landed from inland fishing (81.3%) relative to marine fishing (58.2%) were sold.

Production and sale — institutions in agriculture

Institutions engaged in arable crops produced a total of 1,954,265 metric tonnes and the types of crops are mainly horticultural crops (49.5%), starchy staples (35.2%) and herbs (13.8%). Starchy staples are produced mostly on both small-scale (92.9%), medium-scale (94.5%) and 24.8 percent on large-scale by institutions while majority (58.1%) produce horticultural crops on large-scale.

More than four-fifths (86.2%) of the quantity of tree crops produced by institutions are in the rural areas. Oil-palm represents 75.7 percent of the total quantity of tree crops produced.

The number of livestock reared by institutions is 7,704,450 of which 15.9 percent was produced in the reference period. Poultry constitutes 93.6 percent, of livestock produced. The proportion of livestock off-take that died is exceptionally high (54.7%) among ruminants than any other type of livestock.

Forest tree classified as “Export and domestic” constituted 48.4 percent of total forest trees produced and exclusively (97.7%) dominate the production in urban areas.

Reccomendation

Following from the findings these recommendations are proposed for consideration:

- a) promote agriculture as a viable business among the youth;
- b) mainstream gender and disability issues in agriculture;
- c) enhance production efficiency and yield in agriculture;
- d) diversify agricultural production;
- e) improve agricultural value chain systems; and
- f) enhance use of agricultural statistics for policymaking.

CHAPTER ONE

INTRODUCTION

1.1 Background

The importance of agriculture to the growth of Ghana's economy and the sustenance and health of the population cannot be overemphasised. Agriculture contributed more than one-fifth (21.2%) of the GDP in 2017 (GSS, 2020) and is the largest employer of the workforce, 36.1 percent (GSS, 2016). Yet, given the annual population growth rate of 2.5 percent, agricultural production does not grow correspondingly to meet the increasing demand for food, feed, fuel and fibres. However, improvement in food and nutrition security are core components of the agricultural development and poverty reduction strategy of the Government of Ghana as reported in the Food and Agriculture Sector Development Policy (MoFA, 2007).

Despite its potential for growth, the creation of employment, poverty reduction and improved livelihoods, export revenue, raw materials and development, a number of factors pose challenges to Ghana's agricultural sector. There is over-dependence on rain-fed farming and obsolete technology. Furthermore, low literacy, inadequate financing, lack of access to markets, and poor infrastructure together with adverse conditions such as declining soil fertility, erratic rainfall, drought and prevalence of pests and diseases, are negatively affecting agricultural production. In some places, the ecological conditions combine with poor resource base to reinforce low agricultural productivity, food and nutrition insecurity, while poverty remains detrimental to agricultural production. Significant improvements in the agricultural sector are required to raise the average real incomes of Ghanaian as a whole.

Indeed, the crucial role of agriculture in national growth has been recognised in the national development agenda, where agriculture is expected to lead the growth and structural transformation of the economy and maximise the benefits of accelerated growth. Various interventions over the years seem to be yielding some results, yet not substantially to bring the needed transformation to the sector. Seasonal and inter-seasonal fluctuations in supplies of some staples, particularly plantains, roots and tubers, including cassava and yams, and non-leafy vegetables such as tomatoes and onions, are common. Depending on the season, ecology and the vagaries of the weather, these crops are either scarce, sufficient or in glut at some periods during the year (MoFA, 2010).

Effective planning of the agricultural sector, and ensuring increased production and provision of raw materials to feed industry, should address many of the nation's development targets, including raising income levels, creating more jobs in the agricultural sector and agri-business, and improving the value chain in the sector. Yet after participating in three rounds of the World Censuses of Agriculture—the 1950, the 1970 and 1980 rounds—Ghana did not participate in three succeeding rounds, i.e., the 1990, 2000 and 2010 rounds. The dearth of timely and reliable data to inform planning, monitoring and evaluation of the agriculture sector, over the last three decades, has significantly constrained the effectiveness of intervention strategies.

The collection, compilation, analysis and dissemination of policy-relevant data on agriculture is not institutionalised. Current agricultural statistics in Ghana are usually collected through administrative reporting systems and/or sample surveys. While these methods of data collection are less expensive and more regular than censuses, the data are not comprehensive

enough to give a complete picture of the sector, especially concerning the practices of the households, institutions and holders involved. Timely, accurate and robust agricultural statistics are therefore needed to monitor agricultural and food supply conditions, and to provide information to help governments and policy makers in short-to-medium-term decision-making.

The Census of Agriculture, which produces such data, is a periodic statistical process for collecting, processing and disseminating uniform and comprehensive agricultural data, covering the whole or a significant part of the country. It involves the collection of data at the individual and institutional holding level. Typical data collected in a Census of Agriculture include size of holding or total planted area, number of holdings for each crop type, land tenure arrangements and use, crop area harvested, irrigation, livestock and poultry numbers, labour and other agricultural inputs (FAO, 2015). An agricultural census also provides data for specific geographic areas, including communities and localities.

The 2017/18 Ghana Census of Agriculture (GCA) programme involved a core module carried out on a complete enumeration basis to provide a limited range of key structural items of importance for national policy-making and international comparisons, in conjunction with sample-based census supplementary modules to provide more in-depth data. (FAO, 2015).

1.2 Objectives of the Census

The overall objective of the 2017/18 Ghana Census of Agriculture was to generate more current and reliable information on the structure of agriculture and benchmark data on crops, livestock, aquaculture and tree planting in the 2017 cropping season (from 1st March 2017 to 28th February 2018) as the reference period. The specific objectives of the census are:

Provision of data on the structure of agricultural holdings: including data on the size of holding, land tenure, land use, crop area, irrigation, livestock numbers, labour and other agricultural related activities.

Provision of a wide range of data to strengthen the National Agricultural Information System: for improvements in the production and dissemination of statistics on food and agriculture for policy formulation.

Provision of aggregate totals for fundamental and benchmark agricultural data for intercensal estimates, monitoring and evaluation of agricultural development programmes and projects: under the Food and Agriculture Sector Development Policy (FASDEP II) and Ghana's Coordinated Programme of Economic and Social Development Policies (2017-2024) in consonance with the sustainable development goals (SDGs), and the African Union's (AU's) Agenda 2063.

Identification of spatial variations in agricultural productivity: reflecting changes that occur from time to time and from place to place and enabling the planning and formulation of agricultural policies to tackle underperformances.

Provision of indicators to facilitate evidence-based decision-making, policy development and strategies for development: including estimation of the contribution of the agricultural sector to the GDP and enabling the making of projections based on detailed and reliable data to enhance identification and preparation of targeted strategies for the development of the agricultural sector.

Provision of data for districts and regions, and other small administrative units with detailed cross-classification of farm attributes: agricultural censuses provide the most reliable data available on the area and production of each agricultural commodity at each administrative level for the census reference year.

Enhancement of research: data from the Census will enhance agricultural research, with the view to feeding into policy development.

Facilitation of development and implementation of programmes and projects: the Census of Agriculture will also provide information that will facilitate the development and implementation of programmes and projects on the environment, especially at the community level.

1.3 Scope and coverage

1.3.1 Scope

Consistent with the basic census objectives, the 2017/18 Ghana Census of Agriculture collected information on all agricultural activities of a holder, including; holding location, purpose of production, inventory of production factors, such as area harvested, by crop (arable and tree crops), number of cultivated forest trees, by type of tree, and number of livestock by type (livestock). The Census also involved collecting, processing and analysing data on culturing or growing of non-traditional agriculture produce, such as mushroom, and bee-keeping. It also collected demographic and socio-economic information on the holders, disability status of holders and land use, as well as an inventory on aquaculture. General information on each community about the environment, marketing opportunities, road networks, availability of irrigation infrastructure, storage facilities, health and educational facilities and other natural resources in the community were also covered.

The “Essential Items” and “Frame Items” as recommended by the FAO for the 2020 Round of Agricultural Censuses (FAO, 2015) formed the basis for defining the scope of the census. There are 23 “Essential Items” and information that form the minimum dataset that all countries should collect. The “Essential Items” are important for compiling the minimum set of national indicators on the agricultural sector needed for agricultural policy-making and planning. The “Frame Items” are 15 in number and are directly relevant for the construction of the sampling frame that will be used for the Supplementary/Comprehensive as well as the thematic modules. Details of Essential and Frame Items are in Appendix 1.

Nineteen out of the 23 Essential Items were included in the current data collection. The remaining four items have been deferred to the supplementary phase (Phase III). These are:

- Area of productive and non-productive permanent crops in compact plantation (for each permanent crop type);
- Number of permanent tree crops in scattered plantings (for each tree crop);
- Use of each type of fertilizer; and
- Number of female breeding animals.

In addition, the under listed frame items were deferred to the supplementary phase:

- Use of genetically modified seeds; and
- Presence of woodland on the holding.

The census also gathered data on households engaged in “capture fisheries” i.e., catching marine and freshwater fish.

1.3.2 Coverage

The 2017/18 Ghana Census of Agriculture was a nationwide exercise, which collected data from households and institutions, except embassies and consulates², in all identified structures in the then ten administrative regions³. All structures were listed in both urban and rural areas of Ghana in all the 37,675 Enumeration Areas (EAs) created for the 2010 Population and Housing Census. Data were collected on agricultural activities of households and institutions occupying the structures that were listed. Those engaged in any of the agricultural activities became eligible for the administration of the core module questionnaires which collected more detailed information on the type of agricultural activities engaged in, level and cost of production in 2017/18 crop season, the purpose of production, and the use of modern equipment and fertilizer.

1.4 Institutional arrangements

In conformity with the multifaceted nature of the census, a four-layered governance structure consisting of a National Steering Committee, a National Technical Committee, and Regional and District Management Teams was established. Further, a national census secretariat was set up to oversee the implementation of the exercise.

The National Steering Committee (NSC) was at the apex of the management structure and was responsible for policy setting and direction on all aspects of the census. The composition of the NSC was multi-sectorial with representation at the highest level, from both public and private institutions. The National Technical Committee (NTC), which was the next tier, also had a multi-disciplinary membership, comprising subject-matter specialists from a broad spectrum of Ministries, Departments and Agencies (MDAs), universities, and other research institutions, provided technical advice. The sub-national committees spearheaded the implementation of the census and provided logistical support in their respective regions and districts. (The membership of the committees is presented in Appendix 2.)

The National Census Secretariat, under the leadership of the Ghana Statistical Service (GSS) and Ministry of Food and Agriculture (MoFA), managed the exercise. The Secretariat comprised professional and technical staff of GSS and MoFA, as well as staff of other Ministries, Departments and Agencies (MDAs). The Census Secretariat was headed by the GCA Project Director and supported by the GCA National Coordinator and two deputies, one from MoFA and the other from GSS. The Project Director was responsible for the overall successful implementation of the census programme while the coordinator and the deputies were responsible for the day-to-day implementation of the 2017/18 GCA programme.

Overall, the Secretariat provided general administrative support for the programme; developed methodologies and technical documents; and organised the day-to-day planning, coordination and implementation of the census activities. To ensure the effective implementation of the census, six sub-committees were established under the Secretariat, namely:

² Foreign embassies and consulates are typically considered foreign land.

³ Ghana is currently divided into 16 geographical regions.

- Communication and publicity sub-committee;
- Field operation, material receipt and storage sub-committee;
- Instrument design, recruitment and training sub-committee;
- Tabulation, data processing and report writing sub-committee;
- Audit and quality control sub-committee; and
- Administration and finance sub-committee.

1.5 Organisation of the report

The report is organised in fourteen chapters. The first two chapters comprise the introduction and methodology. The third chapter covers the socio-demographic characteristics and agricultural activities of households and the fourth chapter presents the results on land use by the holders involved in agricultural activities. The fifth chapter, on ownership and use of agricultural equipment, presents the findings on availability of equipment for farming activities. Subsequent chapters, from the sixth to eleventh, focus on aquaculture, capture fisheries, arable crops, tree crops, livestock and forestry pertaining to the households. The twelfth chapter discusses the activities of agricultural institutions. The final two chapters present the summary of findings and conclusion and recommendation.

CHAPTER TWO

METHODOLOGY

2.1 Overview

Data collection for the GCA was guided by the Food and Agriculture Organisation (FAO) principles and recommendations as expressed in the *2020 Round of World Agriculture Censuses* (FAO, 2015). The GCA consequently adopted the modular approach and categorised the process into four implementing phases as follows:

Phase I - preparation of the project documents and the development of instruments;

Phase II - listing exercise and administration of the core and community modules, data analysis, report writing, and dissemination of reports;

Phase III - administration of supplementary and thematic modules on sample basis, data analysis, report writing, and dissemination of reports; and

Phase IV - preparation of the technical reports and dissemination of final results.

The results of Phase II activities is the focus of this report. Phase I activities form part of the administrative report; while Phases III and IV are yet to start.

2.2 Development of instruments

GSS and MoFA held broad stakeholder consultations with relevant agencies on the development of the census instruments (questionnaires and manuals). The participating agencies included selected ministries, departments and agencies (MDAs); Ghana Cocoa Board, the National Development Planning Commission (NDPC), the Ghana Irrigation Development Authority (GIDA), the universities, the Council for Scientific and Industrial Research (CSIR) and other research institutions, civil society organisations and development partners.

The design of the instruments for the census aimed at ensuring complete coverage while avoiding double counting. Four types of questionnaires were developed for the GCA: the Listing questionnaire; the Core Module Household questionnaire; Core Module Institutional questionnaire; and the Community Module questionnaire. A listing exercise was conducted prior to the enumeration of agricultural households to identify all households and institutions engaged in agriculture.

2.2.1 Listing questionnaire

The Listing questionnaire was designed to identify and list all structures, households and institutions in the country. Additionally, it collected data on the use of structures, the physical and the Global Positioning System (GPS) coordinates of structures, and type of agricultural activities undertaken by households and institutions. Further, data were collected on agriculture related activities of the households and institutions, including marketing and processing of agriculture produce.

2.2.2 Core Module Household questionnaire

The Core Module Household questionnaire focused on agricultural holders in households. This questionnaire was administered to all eligible households identified during the listing exercise and solicited detailed information on the agricultural activities of the holders. It included the following sections:

- a) Socio-economic characteristics of household members;
- b) Holder information;
- c) Types of arable crops produced;
- d) Types of tree crops produced;
- e) Livestock produced;
- f) Aquaculture produced;
- g) Forestry; and
- h) Capture fisheries.

2.2.3 Core Module Institutional questionnaire

The Core Module Institutional questionnaire was used to collect detailed information on all eligible institutions identified during the listing exercise as engaged in agricultural activities. The information collected was similar to those covered in the household questionnaire. The structure of the questionnaire was the same as that for the households except for the first section which dealt with the general characteristics of the institution.

2.2.4 Community Module questionnaire

The Community Module questionnaire obtained community level information on the main type of agriculture activity, marketing of agriculture produce, presence of irrigation facilities, the availability of electricity, the socio-economic conditions, the soil types, the environment, and the occurrence of natural disasters. It also gathered information on basic infrastructure, such as schools and training centres, health facilities, social facilities, roads and natural resources of the community, among others.

2.3 Data collection

Face-to-face interviews were used to administer the listing, household and institutional questionnaires. Focus group discussion using a structured pre-coded community questionnaire was used to collect the community level information. The GCA adopted the 37,657 Enumeration Areas (EAs) created by GSS for the 2010 Population and Housing Census. These EAs have well-defined identifiable boundaries on maps and can be canvassed by an enumerator during the data collection period of a population census with an average of 150 households. During the data collection for the 2017/18 GCA, Ghana was administratively divided into ten geographical regions and divided into 216 sub-regional administrative areas: 6 metropolitan, 57 municipal, and 153 district types⁴.

The survey approach was to assign a number of EAs to a team of five enumerators and one supervisor who identified and enumerated households and institutions. Following the listing

⁴ Ghana is currently divided into 16 geographical regions and the regions divided into 260 sub-regional administrative areas: 6 metropolitan, 109 municipal, and 145 district types which will be reflected in the analysis of volume 2.

exercise, households and institutions engaged in agriculture were interviewed using the core household and institutional questionnaires.

In the rural areas, the Community Module questionnaire was administered by the supervisors to focus groups comprising the following:

- a) The chief of the community and his elders;
- b) The Agriculture Extension Officer (where available);
- c) Unit Committee member;
- d) Assembly member;
- e) Local herdsman (where available);
- f) Headmaster/teacher;
- g) Leader of a women's group;
- h) The community best farmer (where available); and
- i) The community youth leader.

The Computer Assisted Personal Interview (CAPI) method was used to collect all the information for the Census through a telemetry device (Tablets). Data were captured using Census and Survey Processing (CSPRO) System software.

2.4 Pre-test and pilot census

All the four questionnaires were pre-tested and piloted in the course of their development to assess the suitability of the questions and instructions, the adequacy and completeness of the questions, the respondents' understanding of the questions, and the procedures and methods of the field work.

The pilot was conducted in areas with intense agricultural activities, including crop production, livestock rearing, fish farming, bee-keeping and tree planting in the various Agro-Ecological Zones (AEZs) — coastal savannah, forest, transitional and northern savannah.

2.5 Recruitment and training of field personnel

A total of 95,050 persons applied online for the field work, out of which 5,475 were selected and trained for the exercise. The training was organised at three levels:

- Eight-day National Training of Trainers (ToT);
- Eight-day Regional ToT; and
- Ten-day district level training of field personnel (supervisors and enumerators).

The objective of these training sessions was to engender a clear understanding of the content of the questionnaires and competence in the administration of the questionnaires and procedures, as well as the use of the CAPI for collecting data. After the district level training, 4,914 field officers were selected. The field officers were constituted into 819 field teams and deployed to the field (Table 2.1).

Table 2.1: Regional distribution of shortlisted and deployed field officers

Region	Number shortlisted for interview	Number of participants for training	Number recruited for field work	Number of teams formed	Number of additional officers trained^{*/}
Total	14,028	5,475	4,914	819	390
Western	1,304	547	492	82	16
Central	1,296	498	450	75	32
Greater Accra	1,780	458	420	70	200
Volta	1,584	588	522	87	15
Eastern	1,727	736	660	110	34
Ashanti	1,878	887	798	133	22
Brong-Ahafo	1,566	618	552	92	17
Northern	1,488	660	588	98	0
Upper East	775	311	276	46	42
Upper West	630	172	156	26	12

*The additional officers were engaged for a short period to complete the listing exercise

2.6 Enumeration Areas (EAs)

All the existing 37,657 EAs were covered with Ashanti Region having the highest number (7,060), more than six times the number for Upper West Region (1,126) which was the lowest (Table 2.2).

Table 2.2: Regional distribution of Enumeration Areas

Region	Number of EAs	Percent of total
Total	37,657	100.0
Western	3,539	9.4
Central	3,234	8.6
Greater Accra	5,405	14.4
Volta	3,616	9.6
Eastern	4,413	11.7
Ashanti	7,060	18.6
Brong-Ahafo	3,672	9.8
Northern	3,869	10.3
Upper East	1,723	4.6
Upper West	1,126	3.0

2.7 Data quality assurance

In order to ensure that high quality data were collected, the Secretariat constituted five groups of field monitors. These were the Steering Committee, the Technical Committee, the Data Processing/Information Technology (DP/IT) team, the Regional Management Committees, and Independent monitors. The monitoring was accomplished through the use of well-structured monitoring guidelines developed by the Secretariat. Each monitoring group visited areas assigned to them to ensure that:

- a) All EAs were covered;
- b) The publicity campaign was effective;
- c) Field logistics were adequate;
- d) Tablets were functioning;
- e) Data collection applications were updated regularly; and
- f) Supervisors were on the field with their enumerators and performing their assigned roles.

2.8 Publicity and education

For successful execution of a large-scale statistical inquiry that requires collaboration of individuals, households and institutions, there was the need to ensure effective sensitisation and awareness of the census. In this regard, a consultant was hired by FAO to develop a strategy

for publicity, education and advocacy before and during the GCA. Based on the findings and recommendations of the consultant and with advice from the Steering Committee; publicity materials including posters, banners, stickers, brochures, flyers, as well as branded T-shirts and caps, were procured and distributed to households and institutions.

The Information Services Department (ISD) of the Ministry of Information, the mass media channels and Community Information Centres were used in the sensitisation programme. The services of the district assemblies and community leaders, including assembly members, unit committee members, traditional and religious leaders were also engaged.

The official launch by His Excellency, the President of the Republic of Ghana, Nana Addo Dankwa Akufo-Addo, deepened the publicity and education on the census.

2.9 Challenges

The listing phase of the GCA had challenges that slowed down the pace of work, notably:

Large number of eligible respondents allocated to teams: as a result of the fast development of settlements especially in the peri-urban areas, some EAs were found to be larger than planned, in some cases by a factor of two or more. Consequently, it took enumerators much longer time than anticipated to complete the enumeration. In certain places, larger EAs necessitated the creation of additional teams.

Coincidence of the administration of the core module questionnaire with the major rainy season: as a result of the over-sized EAs, the scheduled time for the listing phase extended into the major rainy season when some roads and areas became inaccessible due to rivers overflowing their banks and roads becoming unmotorable. This prolonged the listing exercise with its attendant problems.

Increased budget: the prolonged phase of the listing exercise meant additional financing and variation in the payment schedule to enumerators.

Difficulty in handling large numbers and different brands of tablets: The deployment and the overall management of the use of three different brands of tablets with different specifications on such large-scale, posed some difficulties that prolonged the time for the listing to be completed.

Lack of experience in the use of electronic means of data collection on a large-scale: this being the first time GSS experienced the use of CAPI for data collection on such a large-scale (more than 4,000 Tablets) across the country, there was not enough trained staff to support this scale of operations. Moreover, the time for the preparation of the CAPI before the start of fieldwork was inadequate leading to unanticipated delays in resolving issues related to CAPI application.

Unanticipated extension of the fieldwork: data collection on the agricultural households extended beyond expectation due to challenges discussed above, creating difficulties in meeting the eligible respondents.

CHAPTER THREE

SOCIO-DEMOGRAPHIC CHARACTERISTICS AND AGRICULTURAL ACTIVITIES OF HOUSEHOLDS

3.1 Introduction

This chapter provides information on the socio-demographic characteristics such as age, sex, education, marital status, literacy and disability status of members of agricultural households, persons engaged in agricultural activities. Further, the chapter presents information on type of agricultural activities of persons engaged and holders.

3.2 Population in agricultural households

3.2.1 Summary of characteristics of persons in agricultural households

There are 2,585,531⁵ agricultural households with a population of 11,340,947 persons of which 5,663,765 (49.5%) are males. The population of agricultural households in rural areas is 8,527,553 (75.2%). More than 99 percent of the population of agricultural households are Ghanaian of which females (5,643,420) are slightly more than males. About 36 percent of the population are in the first two age groups of 0-14 years (4,044,521) and 15-35 years (4,077,618). A total of 11,218,736, representing 98.9 percent of agricultural households, are without any form of disability. A population of 6,077,994 (57.2%) of persons in agricultural households who are aged 4 years or older have attained basic education while an additional 1,280,263 (12.1%) have attained secondary level of education. For persons who are 11 years or older, about two-thirds are literate in at least one language. More than half of the population of agricultural households (4,635,640) have ever married (Table 3.1).

⁵ This compares well with the number of agricultural households reported in the 2015 Labour Force Survey.

Table 3.1: Population in agricultural households by socio-demographic characteristics, and by type of locality and sex

Characteristics	Urban			Rural			Both		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Relationship									
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	5,663,765	5,677,182	11,340,947
Head	488,929	190,191	679,120	1,435,439	470,972	1,906,411	1,924,368	661,163	2,585,531
Other Members	898,777	1,235,497	2,134,274	2,840,620	3,780,522	6,621,142	3,739,397	5,016,019	8,755,416
Nationality									
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	5,663,765	5,677,182	11,340,947
Ghanaian	1,380,036	1,418,076	2,798,112	4,249,762	4,225,344	8,475,106	5,629,798	5,643,420	11,273,218
Non-Ghanaian	7,670	7,612	15,282	26,297	26,150	52,447	33,967	33,762	67,729
Age									
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	5,663,765	5,677,182	11,340,947
0-14	442,139	448,622	890,761	1,598,512	1,555,248	3,153,760	2,040,651	2,003,870	4,044,521
15-35	513,928	546,527	1,060,455	1,489,631	1,527,532	3,017,163	2,003,559	2,074,059	4,077,618
36-59	335,571	333,290	668,861	906,629	887,429	1,794,058	1,242,200	1,220,719	2,462,919
60+	96,068	97,249	193,317	281,287	281,285	562,572	377,355	378,534	755,889
Disability									
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	5,663,765	5,677,182	11,340,947
Without disability	1,374,770	1,412,229	2,786,999	4,227,564	4,204,175	8,431,739	5,602,334	5,616,404	11,218,738
With disability	12,936	13,459	26,395	48,495	47,319	95,814	61,431	60,778	122,209
Education 4 years or older									
Total	1,313,056	1,347,739	2,660,795	3,997,222	3,963,989	7,961,211	5,310,278	5,311,728	10,622,006
Never attended	188,168	301,091	489,259	1,032,966	1,369,964	2,402,930	1,221,134	1,671,055	2,892,189
Basic	741,177	762,314	1,503,491	2,362,346	2,212,157	4,574,503	3,103,523	2,974,471	6,077,994
Secondary	260,515	216,115	476,630	474,690	328,943	803,633	735,205	545,058	1,280,263
Tertiary	123,196	68,219	191,415	127,220	52,925	180,145	250,416	121,144	371,560
Literacy 11 years or older									
Total	1,082,112	1,113,848	2,195,960	3,145,841	3,126,997	6,272,838	4,227,953	4,240,845	8,468,798
Literate	872,518	777,859	1,650,377	2,133,004	1,785,903	3,918,907	3,005,522	2,563,762	5,569,284
Non-literate	209,594	335,989	545,583	1,012,837	1,341,094	2,353,931	1,222,431	1,677,083	2,899,514
Marital status 16 years or older									
Total	1,055,347	1,087,346	2,142,693	3,055,558	3,042,022	6,097,580	4,110,905	4,129,368	8,240,273
Ever married	532,640	641,272	1,173,912	1,569,317	1,892,411	3,461,728	2,101,957	2,533,683	4,635,640
Never married	522,707	446,074	968,781	1,486,241	1,149,611	2,635,852	2,008,948	1,595,685	3,604,633

3.2.2 Age-sex distribution of agricultural household members

Out of the total population in agricultural households, 75.2 percent (8,527,553) reside in rural areas compared to the 24.8 percent (2,813,394) in urban areas (Table 3.2).

Children (0-14 years) form 35.6 percent, and those aged 15-64 years constitute 60.0 percent while the elderly (65 years or older) form 4.4 percent of the population⁶. Less than one-third (31.7%) of the population residing in urban areas are children aged 0-14 years compared to 37.0 percent of those in rural areas. Among those who live in urban areas, 63.9 percent are aged 15-64 years compared to the 58.6 percent recorded for their rural counterparts (Table 3.2).

There are more females than males in agricultural households⁷. The sex ratio is 99.8 males to 100 females (Table 3.2). This is consistent with the 20-44 years age group and persons who are 70 years or older, whereas for

Sex ratio is expressed as the number of males per 100

age groups 5-19 years and 45-69 years, there are more males than females. With regard to

⁶ This is similar to Ghana's population structure in 2010. (GSS, 2010 PHC)

⁷ *The sex ratio in the general population was 95.2 in 2010 (GSS, 2010 PHC)*

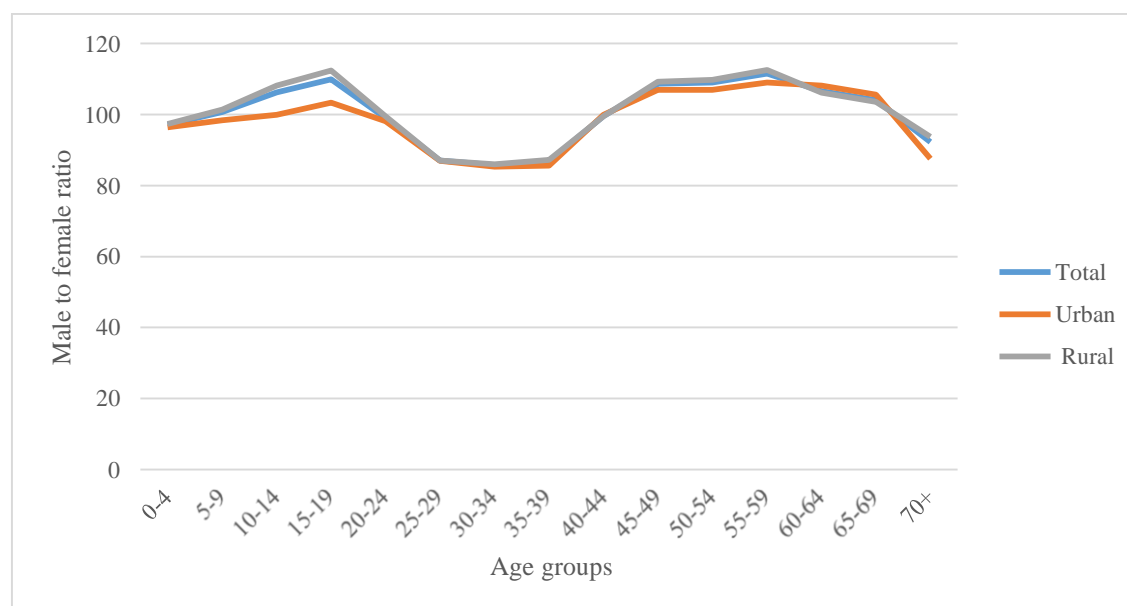
location, the ratio of females to males in urban areas (97.3) in agricultural households is consistent with the general sex distribution while the reverse (100.6) is the case in rural areas.

Table 3.2: Population in agricultural households by age, and by type of locality and sex

Age group	Urban				Rural				Total				Number
	Male	Female	Total	Sex Ratio	Male	Female	Total	Sex Ratio	Male	Female	Total	Sex Ratio	
Total	1,387,706	1,425,688	2,813,394	n/a	4,276,059	4,251,494	8,527,553	n/a	5,663,765	5,677,182	n/a	n/a	11,340,947
Total (%)	100.0	100.0	100.0	97.3	100.0	100.0	100.0	100.6	100.0	100.0	100.0	99.8	
0-4	7.4	7.5	7.5	96.4	9.0	9.3	9.1	97.3	8.6	8.8	8.7	97.1	990,036
5-9	11.6	11.5	11.6	98.4	13.9	13.8	13.9	101.3	13.4	13.2	13.3	100.7	1,508,379
10-14	12.8	12.4	12.6	99.9	14.5	13.5	14.0	108.1	14.1	13.2	13.6	106.2	1,546,106
15-19	12.5	11.8	12.2	103.3	12.6	11.3	11.9	112.3	12.6	11.4	12.0	109.9	1,357,551
20-24	8.6	8.6	8.6	98.1	7.8	7.9	7.9	99.4	8.0	8.1	8.0	99.0	912,890
25-29	7.4	8.3	7.8	86.9	6.6	7.7	7.1	87.0	6.8	7.8	7.3	87.0	829,743
30-34	6.4	7.3	6.9	85.3	5.8	6.8	6.3	85.9	5.9	6.9	6.4	85.7	727,048
35-39	6.7	7.6	7.1	85.6	6.1	7.0	6.5	87.2	6.2	7.1	6.7	86.8	755,870
40-44	6.0	5.9	5.9	99.9	5.3	5.4	5.4	99.4	5.5	5.5	5.5	99.5	623,218
45-49	5.7	5.2	5.5	106.9	5.1	4.7	4.9	109.2	5.2	4.8	5.0	108.6	568,327
50-54	4.7	4.2	4.4	106.9	4.1	3.7	3.9	109.7	4.2	3.9	4.0	109.0	458,417
55-59	3.2	2.9	3.0	109.0	2.7	2.5	2.6	112.5	2.9	2.6	2.7	111.5	307,473
60-64	2.6	2.3	2.4	108.1	2.2	2.1	2.2	106.1	2.3	2.2	2.2	106.6	254,867
65-69	1.8	1.6	1.7	105.6	1.6	1.6	1.6	103.5	1.6	1.6	1.6	104.0	182,972
70+	2.6	2.9	2.7	87.5	2.7	2.9	2.8	93.7	2.7	2.9	2.8	92.2	318,050

There are more males than females in younger age groups between 5 and 19 years in rural areas but little difference exists between males and females in the 10-14 years age group for urban areas. There are more females than males in the age groups between 20 and 44 years for both urban and rural areas. Thereafter, and until age 69 years, males exceed females (Figure 3.1).

Figure 3.1: Age-specific sex ratios of the population in agricultural households by type of locality (males per 100 females)



3.2.3 Youth in agricultural households

The consideration of the youth is as defined by both the United Nations (15-24 years) and the National Youth Policy of Ghana (15-35 years).

Youth 15-24 years - United Nations (UN) definition

The number of youth in agricultural households is 2,270,441 representing 20.0 percent of the total agricultural household population. A similar pattern is observed for both urban (20.7%) and rural (19.8%) areas. Out of the total youth in agricultural households, 51.3 percent are males and 48.7 percent are females. For urban areas, there are almost the same proportions of males and females and for the rural areas, the proportion of males (51.7%) is 3.4 percentage points higher than females (Table 3.3).

Youth 15-35 years – Ghana’s definition

The youth population in agricultural households is 4,077,618, representing 36.0 percent of the total agricultural household population. The youth in urban agricultural households form 37.7 percent of the total population of agricultural households while the proportion for rural agricultural households is 35.4 percent (Table 3.3). The female youth constitutes about 51.0 percent of the total youth population. There are more female youth than male youth in both urban (51.5% and 48.5% respectively) and rural (50.6% and 49.4% respectively) agricultural households.

Table 3.3: Youth (15-35 years) in agricultural households by age, and by type of locality and sex

Age group	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total population	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	5,663,765	5,677,182	11,340,947
15-19	173,734	168,251	341,985	537,169	478,397	1,015,566	710,903	646,648	1,357,551
20-24	119,546	121,900	241,446	334,710	336,734	671,444	454,256	458,634	912,890
25-29	102,650	118,176	220,826	283,333	325,584	608,917	385,983	443,760	829,743
30-35	117,998	138,200	256,198	334,419	386,817	721,236	452,417	525,017	977,434
Youth groups									
15-24	293,280	290,151	583,431	871,879	815,131	1,687,010	1,165,159	1,105,282	2,270,441
15-35	513,928	546,527	1,060,455	1,489,631	1,527,532	3,017,163	2,003,559	2,074,059	4,077,618
Percent of population									
15-24	21.1	20.4	20.7	20.4	19.2	19.8	20.6	19.5	20.0
15-35	37.0	38.3	37.7	34.8	35.9	35.4	35.4	36.5	36.0
Sex composition (%)									
15-24	50.3	49.7	100.0	51.7	48.3	100.0	51.3	48.7	100.0
15-35	48.5	51.5	100.0	49.4	50.6	100.0	49.1	50.9	100.0

3.2.4 Educational attainment and literacy

The population aged 4 years or older forms 93.7 percent of the total agricultural household population (11,340,947). Out of this number, majority have basic education (57.2%), 12.1 percent have secondary/vocational education, and only 3.1 percent have tertiary education. However, more than one-quarter (27.2%) of the agricultural household population have never attended school. The proportion of females who have never attended school (31.5%) is higher than that of males (23.0%). The proportion of household members who have never attended school is higher in rural areas (30.2%) than in urban areas (18.4%).

Except for basic education, where high proportions are observed for both males and females in rural and urban areas, educational attainment is higher among urban than among rural household members.

With respect to tertiary education, there is a relatively higher proportion of persons in urban areas (6.4%) compared to 2.0 percent of those in rural areas (Table 3.4).

Table 3.4: Population 4 years or older in agricultural households by educational attainment and sex, and by type of locality

Educational attainment	Type of locality					
	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both Sexes						
Total	2,660,795	100.0	7,961,211	100.0	10,622,006	100.0
Never attended	489,259	18.4	2,402,930	30.2	2,892,189	27.2
Basic education	1,503,491	56.5	4,574,503	57.5	6,077,994	57.2
Secondary/vocational	476,630	17.9	803,633	10.1	1,280,263	12.1
Post-secondary diploma	19,935	0.7	20,868	0.3	40,803	0.4
Tertiary	171,480	6.4	159,277	2.0	330,757	3.1
Male						
Total	1,313,056	100.0	3,997,222	100.0	5,310,278	100.0
Never attended	188,168	14.3	1,032,966	25.8	1,221,134	23.0
Basic education	741,177	56.4	2,362,346	59.1	3,103,523	58.4
Secondary/vocational	260,515	19.8	474,690	11.9	735,205	13.8
Post-secondary diploma	11,945	0.9	14,165	0.4	26,110	0.5
Tertiary	111,251	8.5	113,055	2.8	224,306	4.2
Female						
Total	1,347,739	100.0	3,963,989	100.0	5,311,728	100.0
Never attended	301,091	22.3	1,369,964	34.6	1,671,055	31.5
Basic education	762,314	56.6	2,212,157	55.8	2,974,471	56.0
Secondary/vocational	216,115	16.0	328,943	8.3	545,058	10.3
Post-secondary diploma	7,990	0.6	6,703	0.2	14,693	0.3
Tertiary	60,229	4.5	46,222	1.2	106,451	2.0

Nearly two-thirds (65.8%) of household members, 11 years or older, are literate in at least one language and 34.2 percent are non-literate in any language (Table 3.5). Out of the total household members, 38.4 percent are literate in both English and a Ghanaian language, 13.6 percent are literate in a Ghanaian language only,

A person is considered literate if he or she can read and write with understanding in a particular language.

while 12.8 percent are literate in English language only. The literacy level for males (71.1%) is higher than that for females (60.5%). Similarly, the proportion of male household members (11 years or older) who are literate in English and a Ghanaian language (43.5%) and English only (14.0%) are higher compared to their female counterparts (33.4% and 11.6% respectively). Generally, literacy rates are higher in urban than in rural areas and follow a similar pattern for both males and females.

Table 3.5: Population 11 years or older in agricultural households by literacy status, language and sex, and by type of locality

Literacy and sex	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both Sexes						
Total	2,195,960	100	6,272,838	100	8,468,798	100
Non-literate	545,583	24.8	2,353,931	37.5	2,899,514	34.2
Literate	1,650,377	75.2	3,918,907	62.5	5,569,284	65.8
English only	305,888	13.9	779,096	12.4	1,084,984	12.8
Ghanaian language only	251,882	11.5	898,597	14.3	1,150,479	13.6
English and Ghanaian	1,073,152	48.9	2,181,172	34.8	3,254,324	38.4
English and French	1,534	0.1	2,909	0	4,443	0.1
English, French and Ghanaian language	3,868	0.2	4,394	0.1	8,262	0.1
Other languages	14,053	0.6	52,739	0.8	66,792	0.8
Male						
Total	1,082,112	100	3,145,841	100	4,227,953	100
Non-literate	209,594	19.4	1,012,837	32.2	1,222,431	28.9
Literate	872,518	80.6	2,133,004	67.8	3,005,522	71.1
English only	163,129	15.1	429,973	13.7	593,102	14
Ghanaian language only	109,175	10.1	425,094	13.5	534,269	12.6
English and Ghanaian	590,162	54.5	1,248,052	39.7	1,838,214	43.5
English and French	872	0.1	1,775	0.1	2,647	0.1
English, French and Ghanaian language	2,292	0.2	2,805	0.1	5,097	0.1
Other languages	6,888	0.6	25,305	0.8	32,193	0.8
Female						
Total	1,113,848	100	3,126,997	100	4,240,845	100
Non-literate	335,989	30.2	1,341,094	42.9	1,677,083	39.5
Literate	777,859	69.8	1,785,903	57.1	2,563,762	60.5
English only	142,759	12.8	349,123	11.2	491,882	11.6
Ghanaian language only	142,707	12.8	473,503	15.1	616,210	14.5
English and Ghanaian	482,990	43.4	933,120	29.8	1,416,110	33.4
English and French	662	0.1	1,134	0	1,796	0
English, French and Ghanaian language	1,576	0.1	1,589	0.1	3,165	0.1
Other languages	7,165	0.6	27,434	0.9	34,599	0.8

3.2.5 Relationship to head of agricultural households

Children of the head of agricultural households form more than half (51.9%) of the agricultural household population and spouses form 13.9 percent. Together, the extended family members of the head and spouse form a little more than one-tenth (11.2%) of the household population. Grandchildren

The extended family comprises relations to the head other than spouse and children.

constitute about 5 percent of the household members. The proportion of male-headed households in urban areas are two and half times that of female-headed household. In rural areas, there are 3 male-headed households to every female-headed household (Table 3.6).

Table 3.6: Members of agricultural households, by relationship to the head, and by type of locality and sex

Relationship	Urban			Rural			Total	
	Male	Female	Total	Male	Female	Total	Number	% share
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	11,340,947	100.0
Head	35.2	13.3	24.1	33.6	11.1	22.4	2,585,531	22.8
Spouse								
(Wife/Husband)	1.4	25.2	13.5	1.1	26.9	14.0	1,572,189	13.9
Child (Son/Daughter)	51.6	48.1	49.8	55.2	50.0	52.6	5,886,912	51.9
Parent/Parent in-law	0.2	1.4	0.8	0.3	1.9	1.1	114,401	1.0
Son/Daughter in-law	0.1	0.6	0.4	0.1	0.8	0.5	51,796	0.5
Grandchild	5.4	5.5	5.5	4.8	4.8	4.8	560,041	4.9
Brother/Sister	3.1	2.5	2.8	3.0	2.3	2.7	306,257	2.7
Step child	0.4	0.5	0.4	0.3	0.4	0.3	41,371	0.4
Foster child	0.2	0.2	0.2	0.1	0.2	0.2	19,835	0.2
Other relative	1.9	2.3	2.1	1.3	1.5	1.4	177,555	1.6
Non-relative	0.4	0.3	0.3	0.2	0.1	0.2	25,059	0.2

3.2.6 Marital status

Of the agricultural household members who are 16 years or older, more than half (53.1%) are married and 33.4 percent have never been married. The proportion of married household members in rural areas (53.9%) is higher than those in urban areas (51.1%). A higher proportion of persons residing in urban areas (36.2%)

Marital status is a demographic parameter indicating a person's civil status with respect to singleness, marriage, co-habitation, divorce, separation, and widowhood.

compared to those in rural areas (32.3%) have never been married. In both urban and rural areas, the proportions of males who have never been married are higher than their female counterparts (by more than 9 percentage points), while widowed females in both urban and rural areas are in higher proportions (about five times higher) than their male counterparts (Table 3.7).

Table 3.7: Population 16 years or older in agricultural households by marital status, and by type of locality and sex

Marital status	Urban			Rural			Total	
	Male	Female	Total	Male	Female	Total	Number	% share
Total	903,993	936,652	1,840,645	2,539,766	2,574,148	5,113,914	6,954,559	n/a
Never married	41.1	31.6	36.2	38.2	26.5	32.3	2,320,869	33.4
Consensual union	3.1	3.3	3.2	3.9	4.2	4.1	265,921	3.8
Married	51.1	51.1	51.1	52.8	54.9	53.9	3,695,345	53.1
Separated	2.0	3.1	2.5	2.0	2.7	2.4	167,338	2.4
Divorced	1.1	2.5	1.8	1.2	2.2	1.7	122,796	1.8
Widowed	1.6	8.4	5.1	1.8	9.4	5.6	382,290	5.5

n/a: Not applicable

Almost all (99.2% of males and 94.6% of females) persons in their early youth (16-19 years) are not married and only about 2 percent are married while majority of household members aged 25-59 years are married. Females marry at an earlier age compared to males. Among age group 20-24 years, 28.1 percent of females compared to 7.6 percent of males are married and at age 25-35 years, 70 percent of females are married compared to about 50 percent of males. Also, nearly one-third of persons 60 years or older are widowed (of which females make 53.2 percent and males 10.8 percent). A similar pattern is observed for both urban and rural areas and there are no marked differences between the age groups (Table 3.8).

Table 3.8: Population 16 years or older in agricultural households by age and sex, and by marital status

Age/Sex	Never married	Consensual union	Married	Separated	Divorced	Widowed	Total	Number
Both Sexes								
Total	33.4	3.8	53.1	2.4	1.8	5.5	100.0	6,954,559
16-19	97.0	0.7	2.1	0.1	0.0	0.1	100.0	1,015,684
20-24	77.6	3.7	17.9	0.4	0.1	0.2	100.0	912,890
25-35	29.4	6.7	60.6	1.9	0.9	0.5	100.0	1,807,177
36-59	3.4	3.8	80.4	4.2	3.1	5.2	100.0	2,462,919
60+	1.6	1.5	57.7	3.3	3.8	32.0	100.0	755,889
Male								
Total	39.0	3.7	52.4	2.0	1.2	1.8	100.0	3,443,759
16-19	99.2	0.2	0.5	0.0	0.0	0.1	100.0	531,548
20-24	90.0	1.9	7.6	0.2	0.1	0.2	100.0	454,256
25-35	41.3	6.8	49.5	1.5	0.6	0.2	100.0	838,400
36-59	4.3	4.2	84.7	3.5	2.0	1.4	100.0	1,242,200
60+	1.6	1.9	79.5	3.3	2.9	10.8	100.0	377,355
Female								
Total	27.9	4.0	53.9	2.8	2.3	9.2	100.0	3,510,800
16-19	94.6	1.3	4.0	0.1	0.0	0.0	100.0	484,136
20-24	65.4	5.5	28.1	0.6	0.2	0.2	100.0	458,634
25-35	19.1	6.6	70.1	2.3	1.2	0.7	100.0	968,777
36-59	2.4	3.3	76.0	4.9	4.2	9.1	100.0	1,220,719
60+	1.7	1.0	36.1	3.4	4.7	53.2	100.0	378,534

Almost all persons in their early youth (16-19 years) have never married (98.2% in urban areas and 96.6% in rural areas) while majority of household members aged 25 years or older are married. Persons in rural areas marry at earlier ages compared to those in urban areas. Among persons in the 20-24 years age group, 20.3 percent in rural areas are married compared to 11.3 percent in urban areas and for age group 25-35 years, 62.9 percent of persons in rural areas are married compared to 54.0 percent in urban areas. (Table 3.9).

Table 3.9: Population 16 years or older in agricultural households by age and type of locality, and by marital status

Age/Type of locality	Never married	Consensual union	Married	Separated	Divorced	Widowed	Total	Number
Urban								
Total	36.2	3.2	51.1	2.5	1.8	5.1	100.0	1,840,645
16-19	98.2	0.5	1.1	0.1	0.0	0.1	100.0	259,997
20-24	85.3	2.8	11.3	0.3	0.1	0.2	100.0	241,446
25-35	37.0	5.8	54.0	1.9	0.8	0.4	100.0	477,024
36-59	3.9	3.1	80.6	4.5	3.2	4.6	100.0	668,861
60+	1.4	1.0	58.7	3.5	4.1	31.3	100.0	193,317
Rural								
Total	32.3	4.1	53.9	2.4	1.7	5.6	100.0	5,113,914
16-19	96.6	0.8	2.5	0.0	0.0	0.1	100.0	755,687
20-24	74.9	4.1	20.3	0.4	0.2	0.2	100.0	671,444
25-35	26.7	7.0	62.9	1.9	1.0	0.5	100.0	1,330,153
36-59	3.2	4.0	80.3	4.1	3.0	5.4	100.0	1,794,058
60+	1.7	1.6	57.4	3.3	3.7	32.3	100.0	562,572

3.2.7 Nationality of agricultural household members

Almost all the agricultural household population are Ghanaian (99.8%). Similar patterns are observed for males and females, and in both urban and rural areas. Among other nationals (25,338), Togolese and Burkinabes outnumber nationals of other countries and constitute

respectively 35.5 and 23.4 percent of the non-Ghanaian agricultural household population (Table 3.10).

Table 3.10: Population in agricultural households by nationality, and by type of locality and sex

Nationality	Urban			Rural			Number
	Male	Female	Total	Male	Female	Total	
Total	1,387,706	1,425,688	2,813,394	4,276,059	4,251,494	8,527,553	11,340,947
Ghanaian	1,384,898	1,423,164	2,808,062	4,265,916	4,241,631	8,507,547	11,315,609
Non-Ghanaian	2,808	2,524	5,332	10,143	9,863	20,006	25,338
% Ghanaian	99.8	99.8	99.8	99.8	99.8	99.8	99.8
% Non-Ghanaian	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Non-Ghanaian	2,808	2,524	5,332	10,143	9,863	20,006	25,338
<i>Burkina Faso</i>	401	312	713	2,683	2,533	5,216	5,929
<i>Cote d'Ivoire</i>	247	321	568	801	850	1,651	2,219
<i>Nigeria</i>	287	229	516	428	433	861	1,377
<i>Togo</i>	785	741	1,526	3,654	3,826	7,480	9,006
<i>Other African</i>	1,013	871	1,884	2,541	2,189	4,730	6,614
<i>Europeans</i>	33	20	53	9	9	18	71
<i>Americas (North, South/Caribbean)</i>	22	18	40	8	14	22	62
<i>Asians</i>	13	7	20	16	5	21	41
<i>Other nationals</i>	7	5	12	3	4	7	19

3.2.8 Persons with disability

There are 122,209 persons in agricultural households with some form of disability and this constitutes 1.1 percent of the agricultural household population.

A person with disability (PWD) is someone who has a physical, mental, intellectual or sensory impairments, which in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others (UN, 2006).

Similar proportions are observed across urban and rural areas and for male as well as female household members. Among the various forms of disabilities, persons who are physically challenged form the highest proportions for both males and females in both urban and rural areas. Among those with some form of disability, close to two-fifths (38.3%) suffer physical disability and about one-fifth have sight disability. The prevalence of all forms of disability is higher in urban areas than rural areas for both males and females (Table 3.11).

Table 3.11: Population in agricultural households by disability status, type of disability and sex, and by type of locality

Status and type of disability	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both sexes						
Total persons	2,813,394	100.0	8,527,553	100.0	11,340,947	100.0
Without Disability	2,786,999	99.1	8,431,739	98.9	11,218,738	98.9
With Disability	26,395	0.9	95,814	1.1	122,209	1.1
Total responses	50,378	100.0	160,428	100.0	210,806	100.0
Sight	11,791	23.4	35,875	22.4	47,666	22.6
Hearing	9,329	18.5	27,588	17.2	36,917	17.5
Speech	10,862	21.6	34,739	21.7	45,601	21.6
Physical	18,396	36.5	62,226	38.7	80,622	38.3
Male						
Total persons	1,387,706	100.0	4,276,059	100.0	5,663,765	100.0
Without Disability	1,374,770	99.1	4,227,564	98.9	5,602,334	98.9
With Disability	12,936	0.9	48,495	1.1	61,431	1.1
Total responses	24,594	100.0	80,001	100.0	104,595	100.0
Sight	5,775	23.5	18,047	22.6	23,822	22.8
Hearing	4,505	18.3	13,522	16.9	18,027	17.2
Speech	5,413	22.0	17,451	21.8	22,864	21.9
Physical	8,901	36.2	30,981	38.7	39,882	38.1
Female						
Total persons	1,425,688	100.0	4,251,494	100.0	5,677,182	100.0
Without Disability	1,412,229	99.1	4,204,175	98.9	5,616,404	98.9
With Disability	13,459	0.9	47,319	1.1	60,778	1.1
Total responses	25,784	100.0	80,427	100.0	106,211	100.0
Sight	6,016	23.3	17,828	22.2	23,844	22.4
Hearing	4,824	18.7	14,066	17.5	18,890	17.8
Speech	5,449	21.1	17,288	21.5	22,737	21.4
Physical	9,495	36.8	31,245	38.8	40,740	38.4

**One person could have more than one disability*

3.2.9 Size of agricultural households

Agricultural households have an average household size of 6.6 persons⁸. The average household size is slightly higher in rural areas (6.6 persons) than in urban areas (6.4 persons). A little more than one-quarter (25.9%) of households have either four or five members. One-quarter (24.7%) of the households have between six and nine members. One-fifth (20.4%) of the total households are single member households. Households with six or more members constitute 31.4 percent in rural areas compared to 26.8 percent in urban areas. The proportions are almost equal in both urban and rural areas for households with 2-3 and 4-5 members. In contrast, one person households form 23.2 percent in urban areas and 19.4 percent in rural areas (Table 3.12).

⁸ Average household size in the general population is 4.4 according to 2010 PHC Analytical Report p.72.

Table 3.12: Population in agricultural households by size of household, and by type of locality

Size of Agricultural households	Urban		Rural		Total	
	Number of households		Number of households		Number of households	
	Number	%	Number	%	Number	%
Total	679,120	100.0	1,906,411	100.0	2,585,531	100.0
1 person	157,247	23.2	370,504	19.4	527,751	20.4
2 - 3 persons	163,891	24.1	444,536	23.3	608,427	23.5
4 - 5 persons	175,771	25.9	492,736	25.8	668,507	25.9
6 - 9 persons	151,046	22.2	487,309	25.6	638,355	24.7
10 persons +	31,165	4.6	111,326	5.8	142,491	5.5
Average household size	6.4		6.6		6.6	

Households headed by persons aged 15-19 years have the highest proportion (50.7%) of single member households. More than one-third (36.2%) of households headed by persons aged 36-59 years have six or more members. About one-fifth (20.4%) of heads of households aged 60 years or older live alone. For female heads aged 60 years or older, 26.8 percent live alone compared to 16.8 percent recorded for their male counterparts (Table 3.13).

Table 3.13: Population in agricultural households by age and sex of head, and by size of household

Age and sex of household head	Size of agricultural households (persons)					Total	Number
	1	2-3	4-5	6-9	10+		
Both sexes							
Total	20.4	23.5	25.9	24.7	5.5	100.0	2,585,531
15-19	50.7	29.4	11.5	7.4	1.0	100.0	5,663
20-24	37.7	39.6	16.3	5.6	0.8	100.0	44,375
25-35	25.4	30.9	28.9	13.4	1.4	100.0	543,480
36-59	17.9	19.4	26.5	30.1	6.1	100.0	1,457,379
60+	20.4	26.0	21.9	23.2	8.5	100.0	534,634
Male							
Total	19.0	21.1	25.8	27.4	6.6	100.0	1,924,368
15-19	50.8	27.6	12.4	8.1	1.1	100.0	4,846
20-24	38.1	38.5	16.6	6.0	0.9	100.0	37,170
25-35	24.5	29.5	29.9	14.4	1.7	100.0	443,153
36-59	16.6	16.5	25.8	33.6	7.4	100.0	1,097,102
60+	16.8	22.8	22.0	27.1	11.2	100.0	342,097
Female							
Total	24.6	30.7	25.9	16.7	2.2	100.0	661,163
15-19	50.3	39.7	6.5	3.3	0.2	100.0	817
20-24	35.8	45.3	15.2	3.5	0.2	100.0	7,205
25-35	29.2	36.9	24.7	8.8	0.4	100.0	100,327
36-59	21.8	28.1	28.7	19.4	2.0	100.0	360,277
60+	26.8	31.7	21.7	16.2	3.6	100.0	192,537

3.3 Characteristics of persons engaged in agricultural activities

3.3.1 Summary of characteristics of persons engaged in agriculture

The total number of persons 15 years or older in agricultural household who are engaged in agriculture is 3,037,381 of which 2,327,023 are in rural areas. More males (1,999,229) than females (1,038,152) are engaged in agriculture. Persons in agricultural households are engaged in five agricultural activities with the three main ones being arable cropping (2,369,402), tree cropping (1,192,990) and livestock rearing (445,973). The number of persons engaged in agriculture who are not Ghanaian (19,560) constitutes less than one percent and persons with disability (40,538) is about one percent. A total of 1,348,866 (44.4%) of persons aged 15 years

or older and engaged in agriculture have attained basic education while 1,283,786 (42.2%)

have never attended school. More than half (53.1%) of persons engaged in agricultural (1,612,937) are literate in at least one language (Table 3.14).

Table 3.14: Persons 15 years or older engaged in agriculture by socio-demographic and economic characteristics, and by type of locality and sex

Characteristics	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Age									
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
15-35	121,485	51,372	172,857	480,201	249,116	729,317	601,686	300,488	902,174
36-59	274,640	127,915	402,555	800,861	401,858	1,202,719	1,075,501	529,773	1,605,274
60+	80,859	54,087	134,946	241,183	153,804	394,987	322,042	207,891	529,933
Nationality									
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Ghanaian	474,029	232,064	706,093	1,511,407	800,321	2,311,728	1,985,436	1,032,385	3,017,821
Non-Ghanaian	2,955	1,310	4,265	10,838	4,457	15,295	13,793	5,767	19,560
Disability status									
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Without disability	471,688	229,566	701,254	1,502,909	792,680	2,295,589	1,974,597	1,022,246	2,996,843
With disability	5,296	3,808	9,104	19,336	12,098	31,434	24,632	15,906	40,538
Education									
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Never	121,791	90,138	211,929	632,508	439,349	1,071,857	754,299	529,487	1,283,786
Basic	218,916	114,114	333,030	691,403	324,433	1,015,836	910,319	438,547	1,348,866
Secondary	77,217	19,898	97,115	138,112	32,904	171,016	215,329	52,802	268,131
Tertiary	59,060	9,224	68,284	60,222	8,092	68,314	119,282	17,316	136,598
Literacy									
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Literate	336,419	121,267	457,686	838,235	317,016	1,155,251	1,174,654	438,283	1,612,937
Non-literate	140,565	112,107	252,672	684,010	487,762	1,171,772	824,575	599,869	1,424,444
Type of agriculture activity									
Total *	611,406	294,592	905,998	2,119,375	1,051,915	3,171,290	2,730,781	1,346,507	4,077,288
Arable crops	331,074	168,244	499,318	1,192,596	668,488	1,861,084	1,523,670	836,732	2,360,402
Tree crops	184,222	98,255	282,477	616,671	293,842	910,513	800,893	392,097	1,192,990
Livestock	75,649	27,009	102,658	257,872	85,443	343,315	333,521	112,452	445,973
Aquaculture	715	105	820	1,060	135	1,195	1,775	240	2,015
Forest trees	2,182	601	2,783	10,914	2,663	13,577	13,096	3,264	16,360
Capture fisheries	17,564	378	17,942	40,262	1,344	41,606	57,826	1,722	59,548

*The total uses activity rather than person as the unit of aggregation and a person may be engaged in more than one activity.

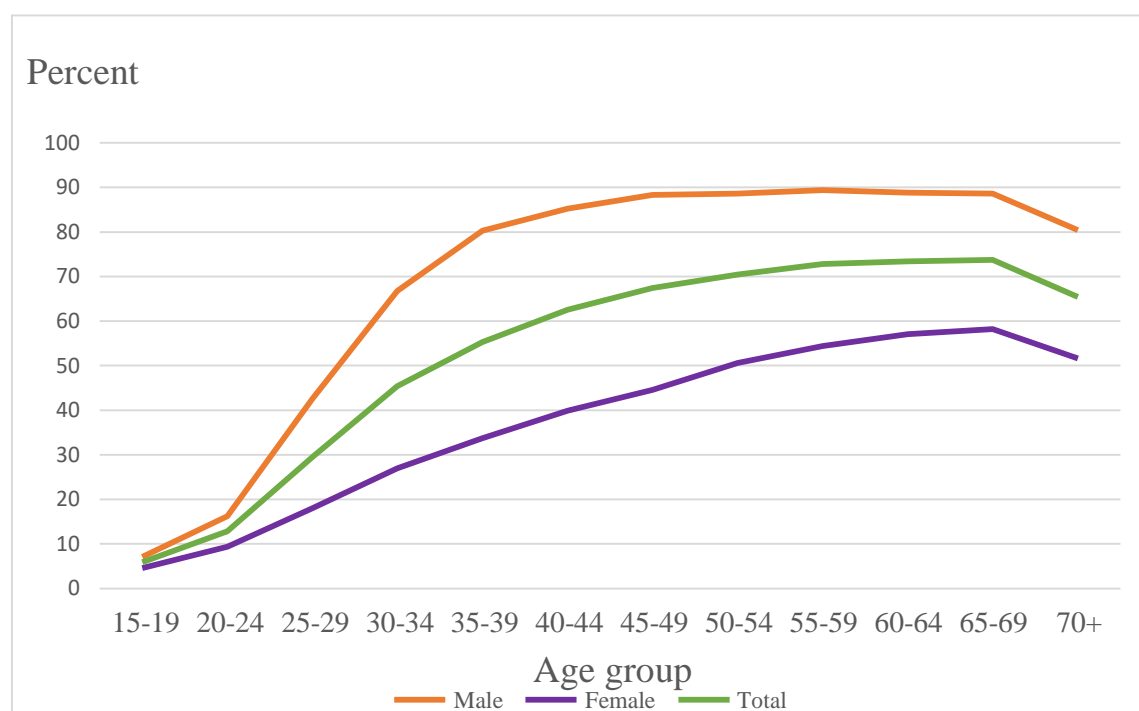
3.3.2 Age-sex distribution of household members engaged in agriculture

The proportion of persons aged 15 years or older in agricultural households who are engaged in agricultural activities is 41.6 percent. Agriculture is a male dominated activity; the proportion of males (55.2%) in agricultural households engaged in agriculture is about two times as high as that of females (28.3%). As persons in agricultural households get older, the proportion that engage in agriculture increases (Table 3.15). At the early ages of 15-19 years, only 5.9 percent of the population in agricultural household are engaged in agricultural activities. This proportion increases as persons in agricultural household get older and peaks at 73.7 percent among those age 65-69 years. This pattern holds true among the male and female populations of agricultural households. However, among the males, the peak is at 55-59 years age group with a proportion of 89.4 percent while for females, the peak is at 65-69 years age group and the proportion is 58.2 percent (Figure 3.2).

Table 3.15: Population 15 years or older in agricultural households and persons engaged in agriculture by age, and by sex

Age group	Population in Agricultural Households			Persons engaged in agricultural activity					
	Male	Female	Total	Male		Female		Total	
(years)	Number	Number	Number	Number	Percent	Number	Percent	Number	Percent
Total	3,623,114	3,673,312	7,296,426	1,999,229	55.2	1,038,152	28.3	3,037,381	41.6
15-19	710,903	646,648	1,357,551	50,369	7.1	29,535	4.6	79,904	5.9
20-24	454,256	458,634	912,890	73,555	16.2	42,886	9.4	116,441	12.8
25-29	385,983	443,760	829,743	163,955	42.5	79,818	18.0	243,773	29.4
30-34	335,571	391,477	727,048	224,138	66.8	105,743	27.0	329,881	45.4
35-39	351,213	404,657	755,870	282,195	80.3	136,170	33.7	418,365	55.3
40-44	310,871	312,347	623,218	264,992	85.2	124,527	39.9	389,519	62.5
45-49	295,847	272,480	568,327	261,318	88.3	121,486	44.6	382,804	67.4
50-54	239,044	219,373	458,417	211,814	88.6	111,022	50.6	322,836	70.4
55-59	162,071	145,402	307,473	144,851	89.4	79,074	54.4	223,925	72.8
60-64	131,528	123,339	254,867	116,754	88.8	70,385	57.1	187,139	73.4
65-69	93,290	89,682	182,972	82,679	88.6	52,176	58.2	134,855	73.7
70+	152,537	165,513	318,050	122,609	80.4	85,330	51.6	207,939	65.4

Figure 3.2: Age-specific rate of participation in agricultural activities by sex of persons in agricultural households (percent)



3.3.3 Youth engaged in agriculture

Youth 15-35 years – Ghana's definition

The youth population engaged in agriculture is 902,174. There are more youth in rural areas (31.3%) engaged in agriculture than those in urban (24.3%) areas. About two-thirds (66.7%) of the youth are males with the proportion of females in the rural areas (34.2%) higher than their counterparts in the urban areas (29.7%). Three in ten persons engaged in agriculture are youth with similar proportion of males (30.1%) and females (28.9%), see Table 3.16.

Table 3.16: Youth (15-35 years) engaged in agriculture by age, and by type of locality and sex

Age group	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
All persons engaged	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
15-19	6,152	2,929	9,081	44,217	26,606	70,823	50,369	29,535	79,904
20-24	11,163	5,013	16,176	62,392	37,873	100,265	73,555	42,886	116,441
25-29	32,389	13,469	45,858	131,566	66,349	197,915	163,955	79,818	243,773
30-35	71,781	29,961	101,742	242,026	118,288	360,314	313,807	148,249	462,056
Youth groups									
15-24	17,315	7,942	25,257	106,609	64,479	171,088	123,924	72,421	196,345
15-35	121,485	51,372	172,857	480,201	249,116	729,317	601,686	300,488	902,174
Percent of population									
15-24	3.6	3.4	3.6	7.0	8.0	7.4	6.2	7.0	6.5
15-35	25.5	22.0	24.3	31.5	31.0	31.3	30.1	28.9	29.7
Sex composition (%)									
15-24	68.6	31.4	100.0	62.3	37.7	100.0	63.1	36.9	100.0
15-35	70.3	29.7	100.0	65.8	34.2	100.0	66.7	33.3	100.0

3.3.4 Educational attainment and literacy status of persons engaged in agriculture

The highest level of education for 44.4 percent of persons in agricultural households engaged in agriculture is basic education while 42.3 percent have never attended school. The proportion of females who have never attended school (51.0%) is higher than that of males (37.7%). The proportion who never attended school in the rural areas is 1.5 times the proportion in urban areas and the proportion who have attained secondary or higher in the urban areas is more than 2 times the proportion in the rural areas. A similar pattern is observed for males and females (Table 3.17).

Table 3.17: Persons 15 years or older engaged in agriculture by educational attainment and sex, and by type of locality

Educational attainment	Type of locality					
	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both Sexes						
Total	710,358	100.0	2,327,023	100.0	3,037,381	100.0
Never attended	211,929	29.8	1,071,857	46.1	1,283,786	42.3
Basic education	333,030	46.9	1,015,836	43.7	1,348,866	44.4
Secondary/vocational	97,115	13.7	171,016	7.3	268,131	8.8
Post-secondary diploma	8,176	1.2	9,436	0.4	17,612	0.6
Tertiary	60,108	8.5	58,878	2.5	118,986	3.9
Male						
Total	476,984	100.0	1,522,245	100.0	1,999,229	100.0
Never attended	121,791	25.5	632,508	41.6	754,299	37.7
Basic education	218,916	45.9	691,403	45.4	910,319	45.5
Secondary/vocational	77,217	16.2	138,112	9.1	215,329	10.8
Post-secondary diploma	6,686	1.4	8,001	0.5	14,687	0.7
Tertiary	52,374	11.0	52,221	3.4	104,595	5.2
Female						
Total	233,374	100.0	804,778	100.0	1,038,152	100.0
Never attended	90,138	38.6	439,349	54.6	529,487	51.0
Basic education	114,114	48.9	324,433	40.3	438,547	42.2
Secondary/vocational	19,898	8.5	32,904	4.1	52,802	5.1
Post-secondary diploma	1,490	0.6	1,435	0.2	2,925	0.3
Tertiary	7,734	3.3	6,657	0.8	14,391	1.4

More than half (53.1%) of person in agricultural households who are engaged in agriculture can read and write in at least one language with understanding and the proportion is higher in urban (64.4%) than in rural (49.6%) areas. The proportion that is literate in English and

Ghanaian language is 38.1 percent. More males (70.5%) than females (52.0%) are literate in at least one language. However, more females (18.9%) than males (13.6%) are literate in only Ghanaian language. A similar pattern is observed for both urban and rural areas. (Table 3.18).

Table 3.18: Persons 15 years or older engaged in agriculture by literacy status, language and sex, and by type of locality

Literacy and sex	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both Sexes						
Total	710,358	100.0	2,327,023	100.0	3,037,381	100.0
Non-literate	252,672	35.6	1,171,772	50.4	1,424,444	46.9
Literate	457,686	64.4	1,155,251	49.6	1,612,937	53.1
<i>English only</i>	70,416	9.9	177,659	7.6	248,075	8.2
<i>Ghanaian language only</i>	108,919	15.3	386,196	16.6	495,115	16.3
<i>English and Ghanaian</i>	271,253	38.1	567,102	24.3	838,355	27.5
<i>English and French</i>	551	0.1	1,222	0.1	1,773	0.1
<i>English, French and Ghanaian language</i>	1,202	0.2	1,851	0.1	3,053	0.1
<i>Other languages</i>	5,345	0.8	21,221	0.9	26,566	0.9
Male						
Total	476,984	100.0	1,522,245	100.0	1,999,229	100.0
Non-literate	140,565	29.5	684,010	44.9	824,575	41.2
Literate	336,419	70.5	838,235	55.1	1,174,654	58.8
<i>English only</i>	54,442	11.4	132,431	8.7	186,873	9.3
<i>Ghanaian language only</i>	64,890	13.6	246,769	16.2	311,659	15.6
<i>English and Ghanaian</i>	212,067	44.5	442,679	29.1	654,746	32.8
<i>English and French</i>	470	0.1	1,024	0.1	1,494	0.1
<i>English, French and Ghanaian language</i>	1,035	0.2	1,612	0.1	2,647	0.1
<i>Other languages</i>	3,515	0.7	13,720	0.9	17,235	0.9
Female						
Total	233,374	100.0	804,778	100.0	1,038,152	100.0
Non-literate	112,107	48.0	487,762	60.6	599,869	57.8
Literate	121,267	52.0	317,016	39.4	438,283	42.2
<i>English only</i>	15,974	6.8	45,228	5.6	61,202	5.9
<i>Ghanaian language only</i>	44,029	18.9	139,427	17.3	183,456	17.7
<i>English and Ghanaian</i>	59,186	25.4	124,423	15.6	183,609	17.7
<i>English and French</i>	81	0.0	198	0.0	279	0.0
<i>English, French and Ghanaian language</i>	167	0.1	239	0.0	406	0.0
<i>Other languages</i>	1,830	0.8	7,501	0.9	9,331	0.9

3.3.5 Relationship of persons engaged to head of household

More than two-thirds of persons engaged in agriculture are heads of the household and 6.3 percent of those engaged are their children while 1.3 percent are their siblings. Higher proportion of males engaged in agriculture are heads of the household in the urban areas (92.9%) than in the rural areas (89.3%), see Table 3.19.

Table 3.19: Persons 15 years or older engaged in agriculture by relationship to the head of household, and by type of locality and sex

Relationship	Urban			Rural			Total	
	Male	Female	Total	Male	Female	Total	Number	% share
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	3,037,381	100
Head	92.9	71.6	610,497	89.3	53.3	1,788,539	2,399,036	79.0
Spouse (Wife/Husband)	0.9	21.7	55,153	0.9	35.7	301,194	356,347	11.7
Child (Son/Daughter)	4.1	3.8	28,469	7.3	6.4	162,853	191,322	6.3
Parent/Parent in-law	0.1	0.9	2,576	0.1	1.4	13,110	15,686	0.5
Son/Daughter in-law	0.0	0.2	681	0.1	0.8	7,254	7,935	0.3
Grandchild	0.2	0.2	1,409	0.3	0.3	6,970	8,379	0.3
Brother/Sister	1.2	1.1	8,149	1.5	1.2	32,365	40,514	1.3
Step child	0.0	0.0	213	0.1	0.1	1,247	1,460	0.0
Foster child	0.0	0.0	123	0.0	0.0	534	657	0.0
Other relative	0.3	0.4	2,363	0.3	0.7	10,333	12,696	0.4
Non-relative	0.1	0.1	725	0.1	0.1	2,624	3,349	0.1

3.3.6 Marital status of persons engaged

About 70 percent of persons engaged in agriculture are married with the proportion of males who are married (76.9%) higher than females (53.8%) and a similar pattern is observed for both urban and rural areas. One in ten of persons engaged in agriculture has never married and again the proportion is higher for males (11.8%) than for females (7.8%). The proportion of females engaged in agriculture who are widowed (21.2%) is about 10 times that of males (2.2%), see Table 3.20.

Table 3.20: Persons 16 years or older engaged in agriculture by marital status, and by type of locality and sex

Marital status	Urban				Rural				Total			
	Male	Female	Total	Number	Male	Female	Total	Number	Male	Female	Total	Number
Total	476,984	233,374	100.0	710,358	1,522,245	804,778	100.0	2,327,023	1,999,229	1,038,152	100.0	3,037,381
Never married	10.7	7.4	9.6	68,317	12.1	7.9	10.7	248,234	11.8	7.8	10.4	316,551
Consensual union	3.9	3.6	3.8	27,184	5.0	4.6	4.9	113,684	4.7	4.4	4.6	140,868
Married	78.7	49.2	69.0	490,062	76.3	55.1	69.0	1,604,920	76.9	53.8	69.0	2,094,982
Separated	2.8	8.3	4.6	32,550	2.7	6.2	3.9	90,603	2.7	6.7	4.1	123,153
Divorced	1.6	7.7	3.6	25,822	1.7	5.7	3.1	71,549	1.7	6.1	3.2	97,371
Widowed	2.3	23.8	9.4	66,423	2.2	20.5	8.5	198,033	2.2	21.2	8.7	264,456

3.3.7 Nationality of persons engaged

Almost all persons engaged in agricultural are Ghanaian (99.7%). Similar situations are observed for males and females in both urban and rural areas. Among other nationals (9,062) who are engaged in agriculture, Togolese (40.7%) and Burkinabe (23.8%) together constitute (64.5%) of non-Ghanaians who are engaged in agricultural activities in Ghana. About 80.0 percent (7,282 out of 9,062) of non-Ghanaians engaged in agriculture are in rural areas (Table 3.21).

Table 3.21: Persons 15 years or older engaged in agriculture by nationality, and by type of locality and sex

Nationality	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Ghanaian	475,599	232,979	708,578	1,516,829	802,912	2,319,741	1,992,428	1,035,891	3,028,319
Non-Ghanaian	1,385	395	1,780	5,416	1,866	7,282	6,801	2,261	9,062
% Ghanaian	99.7	99.8	99.7	99.6	99.8	99.7	99.7	99.8	99.7
% Non-Ghanaian	0.3	0.2	0.3	0.4	0.2	0.3	0.3	0.2	0.3
Non-Ghanaian	1,385	395	1,780	5,416	1,866	7,282	6,801	2,261	9,062
Burkina Faso	17.1	12.9	16.2	27.8	19.3	25.6	25.6	18.2	23.8
Cote d'Ivoire	6.4	17.5	8.8	6.8	7.9	7.1	6.7	9.6	7.4
Nigeria	8.2	7.6	8.1	3.6	2.1	3.2	4.5	3.1	4.2
Togo	33.5	38.7	34.7	37.9	54.6	42.2	37.0	51.8	40.7
Other African	33.5	20.8	30.7	23.5	15.9	21.6	25.6	16.7	23.4
Europeans	0.2	1.5	0.5	0.1	0.1	0.1	0.1	0.3	0.2
Americas*	0.6	0.3	0.5	0.1	0.0	0.1	0.2	0.0	0.1
Asians	0.3	0.8	0.4	0.2	0.1	0.2	0.2	0.2	0.2
Other nationals	0.2	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.1

* North and South America and Caribbean

3.3.8 Disability status of persons engaged

The proportion of persons engaged in agriculture who have some form of disability is 1.3 percent. The urban areas record 1.3% of persons engaged in agriculture who have some form of disability and the rural areas account for 1.4%. Slightly higher proportion of females engaged in agriculture have some form of disability (1.5%) than males (1.2%). A similar pattern is observed among persons engaged in the rural and urban areas (Table 3.22).

Table 3.22: Persons 15 years or older engaged in agriculture by disability status and sex, and by type of locality

Disability status	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both sexes	710,358	100.0	2,327,023	100.0	3,037,381	100.0
Without Disability	701,254	98.7	2,295,589	98.6	2,996,843	98.7
With Disability	9,104	1.3	31,434	1.4	40,538	1.3
Male	476,984	100.0	1,522,245	100.0	1,999,229	100.0
Without Disability	471,688	98.9	1,502,909	98.7	1,974,597	98.8
With Disability	5,296	1.1	19,336	1.3	24,632	1.2
Female	233,374	100.0	804,778	100.0	1,038,152	100.0
Without Disability	229,566	98.4	792,680	98.5	1,022,246	98.5
With Disability	3,808	1.6	12,098	1.5	15,906	1.5

Types of disability of persons engaged

Physical disability (46.1%) is the most prevalent form of disability among persons engaged in agriculture. About a quarter (25.9%) of the responses are persons with sight challenges. Responses of persons who have challenges in hearing and communicating, are each less than one-fifth of total responses for type of disability. A similar pattern is observed for both urban and rural areas and for males and females. Slightly higher proportion of females than males have physical challenges in both urban and rural areas while for the other types of disability, the proportions of males are slightly higher than females in both urban and rural areas (Table 3.23).

Table 3.23: Persons 15 years or older engaged in agriculture by type of disability and sex, and by type of locality

Type of disability	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both sexes						
Total Responses*	13,942	100.0	45,283	100.0	59,225	100.0
Sight	3,555	25.5	11,766	26.0	15,321	25.9
Hearing	2,083	14.9	6,962	15.4	9,045	15.3
Speech	1,777	12.7	5,746	12.7	7,523	12.7
Physical	6,527	46.9	20,809	45.9	27,336	46.1
Male						
Total Responses	8,491	100.0	28,122	100.0	36,613	100.0
Sight	2,226	26.2	7,514	26.7	9,740	26.6
Hearing	1,329	15.7	4,330	15.4	5,659	15.5
Speech	1,205	14.2	3,741	13.3	4,946	13.5
Physical	3,731	43.9	12,537	44.6	16,268	44.4
Female						
Total Responses	5,451	100.0	17,161	100.0	22,612	100.0
Sight	1,329	24.4	4,252	24.8	5,581	24.7
Hearing	754	13.8	2,632	15.3	3,386	15.0
Speech	572	10.5	2,005	11.7	2,577	11.4
Physical	2,796	51.3	8,272	48.2	11,068	48.9

*A person could have more than one form of disability.

3.3.9 Number of persons in households engaged in agriculture

Averagely, about 3 persons in an agricultural household are engaged in agriculture in both urban and rural areas. More than half (54.9%) of persons engaged are from households with 4-9 members. For rural areas, households with size 6-9 members have a higher proportion (29.5%) of persons engaged compared to households with 4-5 members (26.2%) while the converse holds true for urban areas (Table 3.24).

Table 3.24: Persons 15 years or older engaged in agriculture by size of household, and by type of locality

Size of households	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Total	710,358	100.0	2,327,023	100.0	3,037,381	100.0
1 person	127,540	18.0	320,042	13.8	447,582	14.7
2 - 3 persons	167,197	23.5	500,318	21.5	667,515	22.0
4 - 5 persons	191,388	26.9	609,161	26.2	800,549	26.4
6 - 9 persons	179,353	25.2	686,085	29.5	865,438	28.5
10 persons +	44,880	6.3	211,417	9.1	256,297	8.4
Average size per household	2.78		2.99		2.94	

3.4 Characteristics of agricultural holders

3.4.1 Summary of the characteristics of agricultural holders

The total number of agricultural holders is 2,158,697 of which about a quarter (519,788) are youth (15-35 years). A total of 1,736,440 holders cultivate arable crops, 765,885 cultivate tree crops and 324,698 are engaged in livestock rearing. Almost all holders of agriculture are Ghanaian (2,144,571). About 99 percent of holders do not have any form of disability. The number of holders who have attained basic education is 950,903 (44.0%). This is similar to the number, 930,186 (43.1%), who never attended school. More than half of agricultural holders (1,151,915) can read and write with understanding in at least one language (Table 3.25).

Table 3.25: Agricultural holders 15 years or older by socio-demographic and economic characteristics, and by type of locality and sex

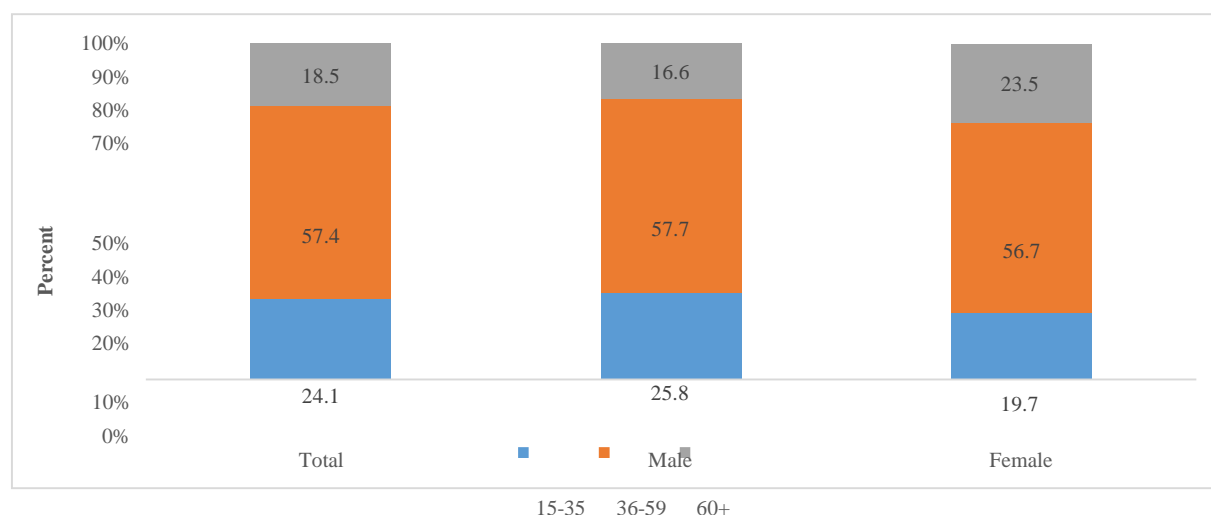
Characteristics	Urban			Rural			Both		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Age									
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
15-35	82,569	25,157	107,726	317,468	94,594	412,062	400,037	119,751	519,788
36-59	214,212	85,304	299,516	680,228	259,347	939,575	894,440	344,651	1,239,091
60+	59,602	35,254	94,856	197,186	107,776	304,962	256,788	143,030	399,818
Nationality									
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
Ghanaian	354,209	144,862	499,071	1,186,554	458,946	1,645,500	1,540,763	603,808	2,144,571
Non-Ghanaian	2,174	853	3,027	8,328	2,771	11,099	10,502	3,624	14,126
Disability status									
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
Without disability	353,349	143,888	497,237	1,182,043	454,979	1,637,022	1,535,392	598,867	2,134,259
With disability	3,034	1,827	4,861	12,839	6,738	19,577	15,873	8,565	24,438
Education									
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
Never	93,409	58,222	151,631	517,530	261,025	778,555	610,939	319,247	930,186
Basic	164,796	71,534	236,330	532,129	182,444	714,573	696,925	253,978	950,903
Secondary	53,759	10,311	64,070	96,568	13,378	109,946	150,327	23,689	174,016
Tertiary	44,419	5,648	50,067	48,655	4,870	53,525	93,074	10,518	103,592
Literacy									
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
Literate	249,619	74,858	324,477	645,430	182,008	827,438	895,049	256,866	1,151,915
Non-literate	106,764	70,857	177,621	549,452	279,709	829,161	656,216	350,566	1,006,782
Type of agriculture activity									
Total*	455,704	178,060	633,764	1,649,605	569,703	2,219,308	2,105,309	747,763	2,853,072
Arable crops	267,598	108,776	376,374	976,236	383,830	1,360,066	1,243,834	492,606	1,736,440
Tree crops	127,044	51,098	178,142	444,697	143,046	587,743	571,741	194,144	765,885
Livestock	58,052	17,830	75,882	207,744	41,072	248,816	265,796	58,902	324,698
Forest trees	1,402	285	1,687	8,446	1,548	9,994	9,848	1,833	11,681
Aquaculture	433	36	469	716	27	743	1,149	63	1,212
Capture fisheries	1,175	35	1,210	11,766	180	11,946	12,941	215	13,156

*The total uses activity rather than person as the unit of aggregation and a person may be engaged in more than one activity.

3.4.2 Age-sex distribution of holders

Agricultural holders are concentrated at 36-59 age groups (57.4%) and this is also true for both sexes (Figure 3.3). Less than one-quarter (24.1%) of holders are youth (15-35 years) and 18.5 percent are aged 60 years or older. Proportionately, there are slightly more male holders than female holders in the 15-35 and 36-59 age groups. On the contrary, the proportion of female holders aged 60 years or older (23.5%) is higher than their male counterpart (16.6%), see (Figure 3.3).

Figure 3.3: Age distribution of holders 15 years or older by sex (percent)



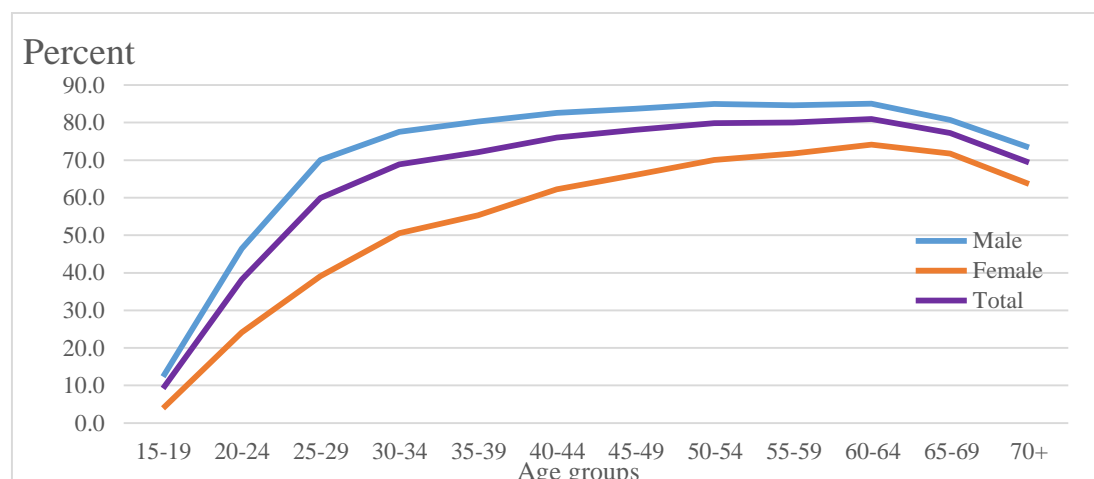
Holders of agriculture are mostly males with the number of males being 2.6 times higher (1,551,265) than the number of females (607,432). The number of holders in each age group increases as holders' age increase and get to the highest point in the age group of 45-49 years. After the age group of 45-49 years, the number decreases in the subsequent age groups. This pattern holds true among the male and female holders of agriculture. However, male holders get to the peak at an earlier age group of 35-39 years with a proportion of 14.6 percent while for female holders, the peak age group is 45-49 and the proportion is 13.2 percent. A similar pattern is observed for urban and rural areas (Table 3.26).

Table 3.26: Agricultural holders 15 years or older by age, and by type of locality and sex

Age group	Urban				Sex	Rural				Sex	Total				Sex
	Male	Female	Total	Ratio		Male	Female	Total	Ratio		Male	Female	Total	Ratio	
Total	356,383	145,715	502,098	245		1,194,882	461,717	1,656,599	259		1,551,265	607,432	2,158,697	255	
15-19	0.2	0.1	961	440		0.4	0.3	6,405	344		0.4	0.3	7,366	355	
20-24	1.5	1	6,741	348		2.4	2	37,736	314		2.2	1.7	44,477	319	
25-29	6.2	4.5	28,755	340		7.7	5.5	117,250	363		7.4	5.2	146,005	359	
30-34	10.9	8.2	51,002	325		11.3	8.8	176,158	333		11.2	8.7	227,160	331	
35-39	14.6	12.1	69,722	294		14.6	12.5	232,013	303		14.6	12.4	301,735	301	
40-44	14.6	12.5	70,198	284		14	12.8	225,996	282		14.1	12.7	296,194	283	
45-49	14.7	13.6	71,985	264		13.9	13	226,931	277		14.1	13.2	298,916	274	
50-54	12.1	13.4	62,735	220		11.4	12.7	195,012	233		11.6	12.9	257,747	230	
55-59	8.5	10.3	45,143	202		7.7	9.1	134,136	220		7.9	9.4	179,279	215	
60-64	6.8	8.9	37,372	187		6.3	8.4	114,064	195		6.4	8.5	151,436	193	
65-69	4.5	6.3	25,170	175		4.3	6	78,953	185		4.3	6.1	104,123	183	
70+	5.4	9	32,314	147		5.9	9	111,945	170		5.8	9	144,259	165	

Proportion of holders among persons engaged increases with age until age 60-64 and declines thereafter. A similar pattern is observed for males and females (Figure 3.4).

Figure 3.4: Age-specific rates of participation of holders 15 years or older in agricultural activities by sex of holder in agricultural households (percent)



3.4.3 Youth holders in agriculture

Youth 15-35 years – Ghana's definition

The youth population of holders of agriculture is 519,788. There are more youth holders in rural (24.9%) than in urban (21.5%) areas. More than three-quarters (77.0%) of the youth in rural as well as in urban areas (76.6%) are male. About a quarter (24.1%) of the agricultural holders are youth. The proportion of youth holders is higher for males (25.8%) than for females (19.7%) in both urban and rural areas by about 6 percentage points (Table 3.27).

Table 3.27: Agricultural holders 15 years or older who are youth (15-35 years) by age, and by type of locality and sex

Age group	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
All holders	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
15-19	783	178	961	4,963	1,442	6,405	5,746	1,620	7,366
20-24	5,236	1,505	6,741	28,615	9,121	37,736	33,851	10,626	44,477
25-29	22,215	6,540	28,755	91,948	25,302	117,250	114,163	31,842	146,005
30-35	54,335	16,934	71,269	191,942	58,729	250,671	246,277	75,663	321,940
Youth groups									
15-24	6,019	1,683	7,702	33,578	10,563	44,141	39,597	12,246	51,843
15-35	82,569	25,157	107,726	317,468	94,594	412,062	400,037	119,751	519,788
Percent of population									
15-24	1.7	1.2	1.5	2.8	2.3	2.7	2.6	2.0	2.4
15-35	23.2	17.3	21.5	26.6	20.5	24.9	25.8	19.7	24.1
Sex composition (%)									
15-24	78.1	21.9	100.0	76.1	23.9	100.0	76.4	23.6	100.0
15-35	76.6	23.4	100.0	77.0	23.0	100.0	77.0	23.0	100.0

3.4.4 Educational attainment and literacy status of holders

About 87 percent of agricultural holders have either basic education (44.0%) or have never attended school (43.1%). Compared to females (41.8%), male holders have a relatively higher (44.9%) proportion of those with basic education. Additionally, female holders (52.6%) who have never attended school are of a higher proportion compared to male holders (39.4%). The proportion of holders who have never attended school is higher in rural areas (47.0%) than in

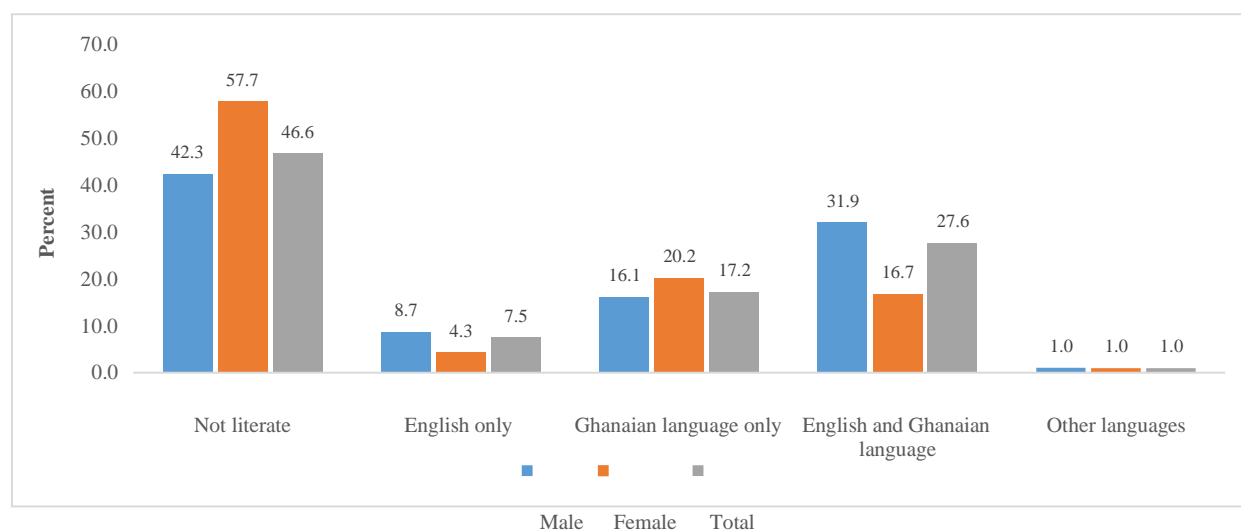
urban areas (30.2%). Further, a relatively higher proportion of holders in urban areas (47.1%) compared to rural areas (43.1%) have basic education (Table 3.28).

Table 3.28: Agricultural holders 15 years or older by educational attainment and sex, and by type of locality

Educational attainment	Type of locality					
	Urban		Rural		Total	
	Number	%	Number	%	Number	%
All						
Total	502,098	100.0	1,656,599	100.0	2,158,697	100.0
Never attended	151,631	30.2	778,555	47.0	930,186	43.1
Basic education	236,330	47.1	714,573	43.1	950,903	44.0
Secondary/vocational	64,070	12.8	109,946	6.6	174,016	8.1
Post-secondary diploma	5,500	1.1	7,062	0.4	12,562	0.6
Tertiary	44,567	8.9	46,463	2.8	91,030	4.2
Male						
Total	356,383	100.0	1,194,882	100.0	1,551,265	100.0
Never attended	93,409	26.2	517,530	43.3	610,939	39.4
Basic education	164,796	46.2	532,129	44.5	696,925	44.9
Secondary/vocational	53,759	15.1	96,568	8.1	150,327	9.7
Post-secondary diploma	4,679	1.3	6,215	0.5	10,894	0.7
Tertiary	39,740	11.2	42,440	3.6	82,180	5.3
Female						
Total	145,715	100.0	461,717	100.0	607,432	100.0
Never attended	58,222	40.0	261,025	56.5	319,247	52.6
Basic education	71,534	49.1	182,444	39.5	253,978	41.8
Secondary/vocational	10,311	7.1	13,378	2.9	23,689	3.9
Post-secondary diploma	821	0.6	847	0.2	1,668	0.3
Tertiary	4,827	3.3	4,023	0.9	8,850	1.5

Overall, 53.4 percent of agricultural holders are literate in at least one language and 46.6 percent are non-literate in any language (Figure 3.3). Of the literate holders, 27.6 percent are literate in both English language and a Ghanaian language, 17.2 percent are literate in a Ghanaian language only, while 7.5 percent are literate in the English language only. The literacy rate for males (57.7%) is higher than that of females (42.3%) by 15.4 percentage points. Similarly, male holders who are literate in English and a Ghanaian language (31.9%) and English only (8.7%) are higher compared to their female counterparts (16.7% and 4.3% respectively), see Figure 3.3.

Figure 3.5: Literacy status and language of holders in agricultural households by sex of holder (percent)



More than half (53.4%) of holders in agriculture can read and write in at least one language with understanding and the proportion is higher in urban (64.6%) than rural (49.9%). The proportion that is literate in English and a Ghanaian language is 27.7 percent. More males (57.7%) than females (42.3%) are literate in at least one language, but more females (20.3%) than males (16.1%) are literate in a Ghanaian language only. A similar pattern is observed for both urban and rural areas. (Table 3.29).

Table 3.29: Agricultural holders 15 years or older by literacy status, language and sex, and by type of locality

Literacy and sex	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both Sexes						
Total	502,098	100	1,656,599	100	2,158,697	100
Non-literate (not literate)	177,621	35.4	829,161	50.1	1,006,782	46.6
Literate	324,477	64.6	827,438	49.9	1,151,915	53.4
Literate						
English only	49,119	9.8	112,349	6.8	161,468	7.5
Ghanaian language only	78,615	15.7	293,665	17.7	372,280	17.2
English and Ghanaian	191,950	38.1	404,658	24.3	596,608	27.7
English and French	440	0.1	941	0.1	1,381	0.1
Engl. Frch. and Gh'ian lang.	877	0.2	1,462	0.1	2,339	0.1
Other languages	3,476	0.7	14,363	0.9	17,839	0.8
Male						
Total	356,383	100	1,194,882	100	1,551,265	100
Non-literate (not literate)	106,764	30.0	549,452	46.0	656,216	42.3
Literate	249,619	70.0	645,430	54.0	895,049	57.7
Literate						
English only	40,403	11.3	94,673	7.9	135,076	8.7
Ghanaian language only	49,075	13.8	200,405	16.8	249,480	16.1
English and Ghanaian	156,479	43.9	338,413	28.3	494,892	31.9
English and French	391	0.1	830	0.1	1,221	0.1
Engl. Frch. and Gh'ian lang.	766	0.2	1,319	0.1	2,085	0.1
Other languages	2,505	0.7	9,790	0.8	12,295	0.8
Female						
Total	145,715	100	461,717	100	607,432	100
Non-literate (not literate)	70,857	48.6	279,709	60.6	350,566	57.7
Literate	74,858	51.4	182,008	39.4	256,866	42.3
Literate						
English only	8,716	6.0	17,676	3.8	26,392	4.3
Ghanaian language only	29,540	20.3	93,260	20.3	122,800	20.3
English and Ghanaian	35,471	24.3	66,245	14.3	101,716	16.8
English and French	49	0.0	111	0.0	160	0.0
Engl. Frch. and Ghanaian lang.	111	0.1	143	0.0	254	0.0
Other languages	971	0.7	4,573	1.0	5,544	0.9

3.4.5 Relationship of holders to head of agricultural households

Nine in ten holders are heads of the household while 1.9 percent of the holders are children of the household head. There are more holders who are children in the rural areas than in urban areas for both males and females. Spouses of the household heads who are holders constitute 5.1 percent of holders. In the rural areas, female spouses who are holders constitute 18.9 percent while in the urban areas, the proportion is 10.6 percent. (Table 3.30).

Table 3.30: Agricultural holders 15 years or older by relationship to the head of household, and by type of locality and sex

Relationship	Urban			Rural			Total	
	Male	Female	Total	Male	Female	Total	Number	% share
Total	356,383.0	145,715.0	502,098	1,194,882.0	461,717.0	1,656,599	2,158,697	100.0
Head	97.0	85.9	470,880	96.5	77.0	1,508,096	1,978,976	91.7
Spouse (Wife/Husband)	0.5	10.6	17,297	0.5	18.9	93,125	110,422	5.1
Child (Son/Daughter)	1.5	1.6	7,712	2.1	1.8	32,901	40,613	1.9
Parent/Parent in-law	0.1	0.6	1,077	0.1	0.9	4,825	5,902	0.3
Son/Daughter in-law	0.0	0.1	225	0.0	0.2	1,361	1,586	0.1
Grandchild	0.1	0.1	386	0.1	0.1	1,383	1,769	0.1
Brother/Sister	0.6	0.8	3,411	0.6	0.8	11,266	14,677	0.7
Step child	0.0	0.0	58	0.0	0.0	199	257	0.0
Foster child	0.0	0.0	28	0.0	0.0	112	140	0.0
Other relative	0.1	0.2	796	0.1	0.3	2,804	3,600	0.2
Non-relative	0.0	0.1	228	0.0	0.0	527	755	0.0

3.4.6 Marital status of holders

More than 72 percent of holders who are 16 years or older, are married and 6.2 percent have never married. The proportion of married holders in urban areas (82.9%) is almost the same as those in rural areas (82.4%). In both urban and rural areas, the proportions of males who have never married are higher than their female counterparts, while widowed females in both urban and rural areas have higher proportions (about fourteen times as high) than their male counterparts (Table 3.31).

Table 3.31: Agricultural holders 16 years or older by marital status, type of locality and sex

Marital status	Urban			Rural			Total	
	Male	Female	Total	Male	Female	Total	Number	% share
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	2,158,697	100.0
Never married	7.6	5.8	35,367	6.5	4.3	98,091	133,458	6.2
Consensual union	3.6	3.5	17,994	4.8	4.0	75,862	93,856	4.3
Married	82.9	43.8	359,183	82.4	46.6	1,199,883	1,559,066	72.2
Separated	2.5	9.7	22,947	2.5	8.6	69,636	92,583	4.3
Divorced	1.6	10.0	20,230	1.7	8.4	58,997	79,227	3.7
Widowed	1.9	27.3	46,377	2.1	28.1	154,130	200,507	9.3

3.4.7 Nationality

Almost all holders in agriculture are Ghanaian (99.7%). Similar situations are observed for males and females in both urban and rural areas. Among other nationals (6,280), Togolese (45.5%) and Burkinabe (20.8%) constitute 66.3 percent of non-Ghanaians who are agricultural holders in Ghana. About 79 percent (4,986 out of 6,280) of non-Ghanaians engaged in agriculture are in rural areas (Table 3.32).

Table 3.32: Agricultural holders 15 years or older by nationality, and by type of locality and sex

Nationality	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	356,383	145,715	502,098	1,194,882	461,717	1,656,599	1,551,265	607,432	2,158,697
Ghanaian	355,339	145,465	500,804	1,190,941	460,672	1,651,613	1,546,280	606,137	2,152,417
Non-Ghanaian	1,044	250	1,294	3,941	1,045	4,986	4,985	1,295	6,280
% Ghanaian	99.7	99.8	99.7	99.7	99.8	99.7	99.7	99.8	99.7
% non-Ghanaian	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3
Non-Ghanaian	1,044	250	1,294	3,941	1,045	4,986	4,985	1,295	6,280
Burkina Faso	17.2	7.6	15.4	24.7	12.7	22.2	23.1	11.7	20.8
Cote d'Ivoire	5.2	17.6	7.6	6.0	7.1	6.2	5.8	9.1	6.5
Nigeria	7.2	7.6	7.3	3.8	2.0	3.4	4.5	3.1	4.2
Togo	38.4	43.6	39.4	42.9	62.9	47.1	42.0	59.2	45.5
Other African	30.8	22.0	29.1	22.3	15.2	20.8	24.1	16.5	22.5
Europeans	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1
Americas	0.5	0.0	0.4	0.1	0.0	0.0	0.1	0.0	0.1
Asians	0.3	1.2	0.5	0.1	0.0	0.1	0.2	0.2	0.2
Other nationals	0.3	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.1

Americas: (North, South and Caribbean)

3.4.8 Disability status of agricultural holders

There are 24,438 holders aged 15 years or older with some form of disability. This constitutes 1.1 percent of all agricultural holders aged 15 years or older (with the urban areas recording 1.0% and the rural 1.2%). Proportionately, slightly more female holders (1.4%) than male

holders (1.0%) have some disability conditions. This holds true in both urban and rural areas (Table 3.33).

Table 3.33: Agricultural holders 15 years or older by disability status and sex, and by type of locality

Disability status	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both sexes						
Total	502,098	100.0	1,656,599	100.0	2,158,697	100.0
Without Disability	497,237	99.0	1,637,022	98.8	2,134,259	98.9
With Disability	4,861	1.0	19,577	1.2	24,438	1.1
Male						
Total	356,383	100.0	1,194,882	100.0	1,551,265	100.0
Without Disability	353,349	99.1	1,182,043	98.9	1,535,392	99.0
With Disability	3,034	0.9	12,839	1.1	15,873	1.0
Female						
Total	145,715	100.0	461,717	100.0	607,432	100.0
Without Disability	143,888	98.7	454,979	98.5	598,867	98.6
With Disability	1,827	1.3	6,738	1.5	8,565	1.4

There are 37,226 total responses on disability conditions of holders, with two disability conditions, physical (41.4%) and sight (27.7%) constituting more than two-thirds of the cases. The proportion of physical disability condition is high among female (44.7%) holders compared to males (39.8%) while the prevalence of the other disability conditions is higher among male than female holders in both urban and rural areas (Table 3.34).

Table 3.34: Agricultural holders by type of disability and sex, and by type of locality

Type of disability	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Both sexes						
Total Responses*	8,074	100.0	29,152	100.0	37,226	100.0
Sight	2,188	27.1	8,125	27.9	10,313	27.7
Hearing	1,417	17.6	4,886	16.8	6,303	16.9
Speech	1,198	14.8	3,985	13.7	5,183	13.9
Physical	3,271	40.5	12,156	41.7	15,427	41.4
Male						
Total Responses	5,259	100.0	19,504	100.0	24,763	100.0
Sight	1,440	27.4	5,529	28.3	6,969	28.1
Hearing	952	18.1	3,324	17.0	4,276	17.3
Speech	846	16.1	2,814	14.4	3,660	14.8
Physical	2,021	38.4	7,837	40.2	9,858	39.8
Female						
Total Responses	2,815	100.0	9,648	100.0	12,463	100.0
Sight	748	26.6	2,596	26.9	3,344	26.8
Hearing	465	16.5	1,562	16.2	2,027	16.3
Speech	352	12.5	1,171	12.1	1,523	12.2
Physical	1,250	44.4	4,319	44.8	5,569	44.7

*A person could have more than one form of disability.

3.4.9 Number of holders in a household

There is an average of 3 holders in an agricultural household with at least one holder. The average number of holders in a household is slightly higher in rural areas (2.95 persons) than in urban areas (2.83 persons). A little more than one-quarter (27.5%) of holders are in households where the number of holders are 4-5. Holders who are in households with members from 6-9 are also more than a quarter (28.4%). Less than 15 percent of holders are in single

member households. Households with six or more members have 36.8 percent of holders in rural areas compared to 32.3 percent in urban areas. The proportions are almost equal in both urban and rural areas for 2-3 and 4-5 member households. In contrast, one person households form 15.8 percent of holders in urban areas and 13.5 percent in rural areas (Table 3.35).

Table 3.35: Agricultural holders 15 years or older by household size, and by type of locality

Size of households	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Total	502,098	100	1,656,599	100	2,158,697	100
1 person	79,437	15.8	224,259	13.5	303,696	14.1
2 - 3 persons	118,036	23.5	370,803	22.4	488,839	22.6
4 - 5 persons	142,172	28.3	452,036	27.3	594,208	27.5
6 - 9 persons	131,788	26.2	481,061	29	612,849	28.4
10 persons +	30,665	6.1	128,440	7.8	159,105	7.4
Average size per household	2.83		2.95		2.92	

3.5 Socio-economic characteristics of persons engaged

3.5.1 Type of agricultural activity of persons engaged

Agricultural activity in Ghana is dominated by arable and tree crops farming. Nearly 8 in every 10 (77.7%) and more than one-third (39.3%) of the total household population of persons engaged cultivate arable and tree crops respectively. More than one-tenth (14.6%) of the household population are also engaged in livestock activities. A relatively higher proportion of females (80.6%) than males (76.2%) cultivate arable crops whereas a higher proportion of males (40.1%) than females (37.8%) grow tree crops. A similar pattern is observed in rural areas. Except for rural areas where the proportion of males are higher than females in the cultivation of tree crops, the proportion of females are higher than males in the cultivation of arable and tree crops in both urban and rural areas (Table 3.36).

Table 3.36: Persons 15 years or older engaged in agriculture by type of agricultural activity, type of locality and sex

Type of activity	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	476,984	233,374	710,358	1,522,245	804,778	2,327,023	1,999,229	1,038,152	3,037,381
Arable crops	69.4	72.1	70.3	78.3	83.1	80.0	76.2	80.6	77.7
Tree crops	38.6	42.1	39.8	40.5	36.5	39.1	40.1	37.8	39.3
Livestock	15.8	11.6	14.4	16.9	10.6	14.7	16.6	10.8	14.6
Aquaculture	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1
Forest trees	0.5	0.3	0.4	0.7	0.3	0.6	0.7	0.3	0.5
Bee-keeping	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Capture fisheries	3.7	0.2	2.5	2.6	0.2	1.8	2.9	0.2	2.0

Note: An individual may engage in more than one agricultural activity

3.5.2 Age of persons engaged in an agricultural activity

More youth in rural areas (33.1%) are engaged in arable cropping than those in the urban areas (26.0%). Conversely, persons older than 35 years living in urban areas (74.0%) do more arable crop farming than their rural counterparts (66.9%), see Table 3.37.

About 57 percent (56.9%) of urban dwellers cultivating arable crops fall within the age group of 36-59 years, compared with 51.1 percent of their rural counterparts. For persons engaged in

tree crops, more than half (55.0%) are aged from 36 to 59 years with more than a fifth (22.3%) being 60 years or older. Similar patterns are observed in urban and rural areas as well as for males and females. For livestock breeding, one-fifth (20.4%) of persons engaged are between the ages of 25-35 years and 18.9 percent are aged over 60 years. Other activities such as aquaculture, forest trees and bee-keeping all follow the same trend except for capture fisheries where proportions of persons aged 60 years or more are less than 10 percent. The proportions of young holders (25-35 years) are higher in rural areas than in urban areas for all types of agriculture while the opposite is true for older persons in the age group 36-59 except for those engaged in forest trees where the proportion for rural is slightly higher than urban areas. (Table 3.37).

Table 3.37: Agricultural holders 15 years or older by age and sex, and by type of agricultural activity and type of locality

Sex /Age	Arable crops			Tree crops			Livestock		
group	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes	499,318	1,861,084	2,360,402	282,477	910,513	1,192,990	102,329	342,416	444,745
15-19	1.5	3.5	3.1	0.8	1.9	1.6	1.2	3.5	3
20-24	2.5	4.7	4.3	1.5	2.8	2.5	1.9	3.8	3.3
25-35	22.0	24.9	24.2	15.3	19.6	18.6	18.8	20.9	20.4
36-59	56.9	51.1	52.3	56.7	54.5	55	58.2	53.2	54.4
60+	17.1	15.8	16.1	25.8	21.2	22.3	19.9	18.6	18.9
Male	331,074	1,192,596	1,523,670	184,222	616,671	800,893	75,348	257,043	332,391
15-19	1.5	3.4	3	0.7	1.7	1.5	1.2	3.1	2.7
20-24	2.5	4.5	4.1	1.5	2.6	2.4	2	3.4	3.1
25-35	22.9	25.2	24.7	16.2	20.4	19.5	19.8	21.1	20.8
36-59	57.6	51.9	53.1	58.2	55.7	56.3	59	54.1	55.2
60+	15.4	15	15.1	23.4	19.5	20.4	18	18.3	18.2
Female	168,244	668,488	836,732	98,255	293,842	392,097	26,981	85,373	112,354
15-19	1.5	3.7	3.3	0.8	2.3	1.9	1.1	4.7	3.8
20-24	2.5	5.2	4.6	1.5	3.2	2.8	1.6	4.8	4.1
25-35	20.2	24.2	23.4	13.6	17.9	16.8	16.1	20.2	19.2
36-59	55.4	49.7	50.8	53.8	51.8	52.3	56	50.6	51.9
60+	20.4	17.2	17.9	30.3	24.7	26.1	25.2	19.7	21

Table 3.37: Agricultural holders 15 years or older by age and sex, and by type of agricultural activity and type of locality (cont'd)

Sex /Age	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
group	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes	820	1,195	2,015	2,783	13,577	16,360	329	899	1,228	17,942	41,606	59,548
15-19	0.9	2.2	1.6	0.1	0.6	0.5	0.3	0.4	0.4	0.9	0.9	0.9
20-24	1.6	3.1	2.5	0.7	1.4	1.3	2.1	2.7	2.5	3.3	4.1	3.9
25-35	18.5	21.3	20.1	13.9	17.4	16.8	14.9	20.0	18.6	28.1	29.2	28.9
36-59	58.4	57.0	57.6	55.0	55.7	55.6	57.8	57.3	57.4	59.6	56.7	57.6
60+	20.6	16.5	18.2	30.3	24.8	25.7	24.9	19.6	21.0	8.2	9.0	8.8
Male	715	1,060	1,775	2,182	10,914	13,096	301	829	1,130	17,564	40,262	57,826
15-19	0.7	1.6	1.2	0.0	0.5	0.5	0.3	0.4	0.4	0.9	0.9	0.9
20-24	1.7	2.5	2.1	0.5	1.5	1.3	2.3	2.7	2.6	3.4	4.1	3.9
25-35	18.3	20.1	19.4	13.3	17.8	17.0	15.9	20.3	19.1	28.3	29.4	29.1
36-59	59.2	58.1	58.5	56.9	56.7	56.7	55.8	56.6	56.4	59.5	56.7	57.5
60+	20.1	17.7	18.7	29.1	23.5	24.5	25.6	20.1	21.6	8.0	8.9	8.6
Female	105	135	240	601	2,663	3,264	28	70	98	378	1,344	1,722
15-19	1.9	6.7	4.6	0.5	0.9	0.8	0.0	1.4	1.0	0.8	1.5	1.3
20-24	1.0	8.1	5.0	1.2	1.4	1.3	0.0	2.9	2.0	1.6	4.8	4.1
25-35	20.0	30.4	25.8	15.8	16.2	16.1	3.6	17.1	13.3	18.0	22.7	21.7
36-59	53.3	48.1	50.4	48.1	51.7	51.0	78.6	65.7	69.4	63.8	59.1	60.1
60+	23.8	6.7	14.2	34.4	29.9	30.7	17.9	12.9	14.3	15.9	11.9	12.8

3.5.3 Multiple agricultural activities of persons engaged

About 70 percent of persons aged 15 years or older are engaged in a single agricultural activity. A little over one-quarter (26.5%) are engaged in two different agricultural activities with the remaining 3.7 percent engaged in three or more agricultural activities. Compared to the other age groups, the age group of 36 years or older have higher proportions of persons engaged in multiple activities (Table 3.38).

Proportionately, more women than men are engaged in a single agricultural activity at all ages except for the 15-19 age group. A similar pattern is observed for males and females as well as in urban and rural areas. However, more males engage in double agricultural activities than females. In rural areas, both males and females engage in multiple agricultural activities.

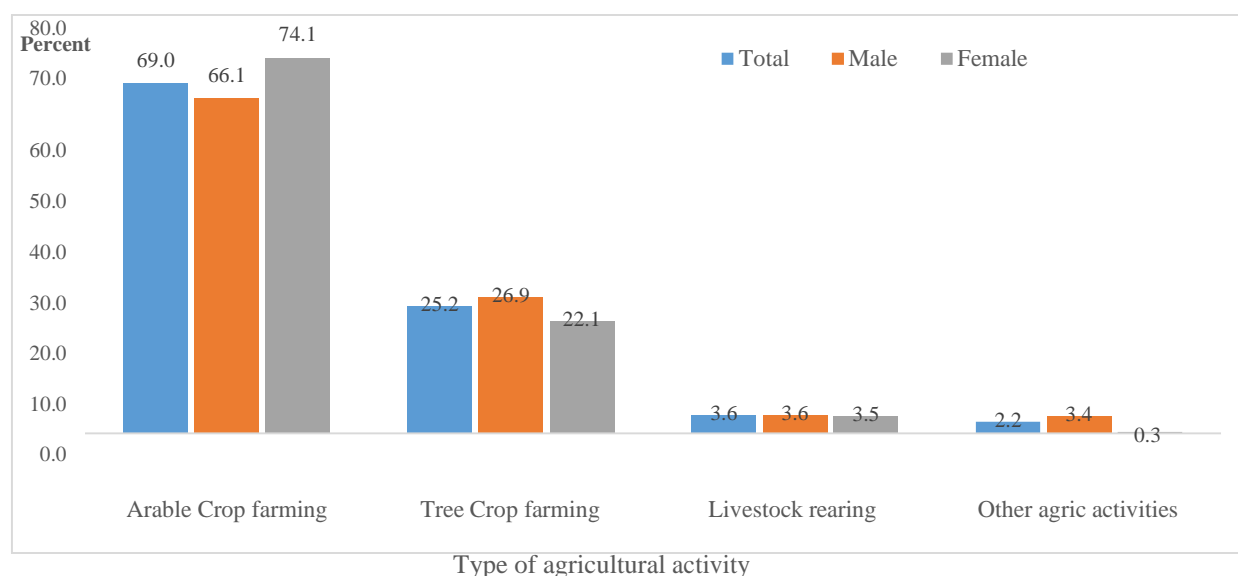
Table 3.38: Persons 15 years or older engaged in agriculture by age and sex, and by type of locality and number of agricultural activities

Sex/Age of holders	Number of agricultural activities										Total				
	Urban					Rural									
	All					All					All				
	1	2	3	4+	activities	1	2	3	4+	activities	1	2	3	4+	activities
Both Sexes															
Total	75.1	22.4	2.5	0.1	710,358	68.1	27.8	4.0	0.2	2,327,023	69.7	26.5	3.6	0.1	3,037,381
15-19	79.4	18.9	1.6	0.0	9,082	70.0	25.8	4.2	0.0	70,823	71.1	25.0	3.9	0.0	79,905
20-24	81.4	17.2	1.4	0.0	16,179	74.7	22.3	2.9	0.1	100,265	75.6	21.6	2.7	0.1	116,444
25-35	81.0	17.4	1.5	0.0	147,613	72.9	24.0	3.0	0.1	558,229	74.6	22.6	2.7	0.1	705,842
36-59	74.5	22.9	2.6	0.1	402,555	66.6	28.9	4.3	0.2	1,202,719	68.6	27.4	3.9	0.2	1,605,274
60+	69.4	27.0	3.4	0.1	134,946	63.7	31.5	4.6	0.2	394,987	65.2	30.4	4.3	0.2	529,933
Male															
Total	74.7	22.6	2.6	0.1	476,984	65.6	29.8	4.4	0.2	1,522,245	67.8	28.1	4.0	0.2	1,999,229
15-19	80.2	18.3	1.5	0.0	6,153	70.1	25.8	4.1	0.0	44,217	71.3	24.9	3.8	0.0	50,370
20-24	82.0	16.5	1.4	0.1	11,166	74.1	23.1	2.8	0.1	62,392	75.3	22.1	2.6	0.1	73,558
25-35	80.6	17.8	1.5	0.0	104,181	70.8	25.9	3.1	0.1	373,592	73.0	24.2	2.7	0.1	477,773
36-59	73.9	23.2	2.8	0.1	274,640	64.0	31.0	4.8	0.3	800,861	66.5	29.0	4.3	0.2	1,075,501
60+	68.2	27.7	3.9	0.2	80,859	59.9	34.4	5.5	0.3	241,183	62.0	32.7	5.1	0.3	322,042
Female															
Total	76.0	21.8	2.1	0.0	233,374	72.7	23.9	3.3	0.1	804,778	73.5	23.5	3.0	0.1	1,038,152
15-19	77.8	20.2	1.9	0.0	2,929	69.8	25.7	4.4	0.1	26,606	70.6	25.2	4.2	0.1	29,535
20-24	80.1	18.6	1.3	0.0	5,013	75.7	21.1	3.2	0.0	37,873	76.2	20.8	3.0	0.0	42,886
25-35	82.1	16.5	1.4	0.0	43,432	77.0	20.1	2.8	0.1	184,637	78.0	19.4	2.5	0.0	228,069
36-59	75.7	22.1	2.2	0.0	127,915	71.8	24.7	3.5	0.1	401,858	72.7	24.0	3.2	0.1	529,773
60+	71.2	26.0	2.7	0.0	54,087	69.7	27.0	3.3	0.1	153,804	70.1	26.7	3.1	0.1	207,891

3.5.4 Single agricultural activity of persons engaged

Of all persons engaged in only one agricultural activity, majority (69.0%) are engaged in arable cropping, about one-quarter (25.2%) are engaged in tree crop farming and 5.8 percent are engaged in livestock rearing and other activities (Figure 3.6). A higher proportion of female (74.1%) than male (66.1%) are engaged in arable crop farming whereas males (26.9%) are of a higher proportion than females (22.1%) engaged in tree crop farming.

Figure 3.6: Type of single agricultural activity of persons 15 years or older by sex of person (percent)



3.5.5 Education and literacy status of persons engaged

More than four-fifths of persons engaged in agriculture have either never attended or attained basic level of education for all types of agricultural activities with the exception of persons engaged in bee keeping (71.6%) and aquaculture (58.7%). These proportions are higher for females than males and also higher in rural areas than in urban areas.

Persons engaged who have attained tertiary level of education are mostly engaged in aquaculture (20.6%) and bee-keeping (11.7%) and most of such persons are in urban areas—aquaculture (33.3%) and bee-keeping (25.5%). Persons engaged with the least proportions in tertiary education are those engaged in capture fisheries (Table 3.39).

Table 3.39: Persons 15 years or older engaged in agriculture by educational attainment and sex, and by type of agricultural activity and type of locality

Educational attainment/ Sex of holder	Arable crops			Tree crops			livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All									
Total	499,318	1,861,084	2,360,402	282,477	910,513	1,192,990	102,329	342,416	444,745
Never attended	32.0	49.1	45.5	22.4	31.1	29.0	28.8	53.3	47.7
Basic education	45.4	40.9	41.8	56.2	58.1	57.7	41.2	35.8	37.1
Secondary/vocational	13.3	7.2	8.5	12.9	7.9	9.1	15.7	7.2	9.1
Post-secondary diploma	1.1	0.4	0.5	1.1	0.5	0.6	1.6	0.4	0.7
Tertiary	8.2	2.5	3.7	7.3	2.4	3.6	12.7	3.3	5.4
Male									
Total	331,074	1,192,596	1,523,670	184,222	616,671	800,893	75,348	257,043	332,391
Never attended	28.2	45.2	41.5	15.3	25.1	22.9	25.9	52.8	46.7
Basic education	43.9	41.9	42.4	57.6	61.4	60.5	39.1	34.7	35.7
Secondary/vocational	15.8	8.9	10.4	15.8	9.7	11.1	17.8	8.0	10.2
Post-secondary diploma	1.3	0.5	0.7	1.4	0.6	0.8	1.8	0.5	0.8
Tertiary	10.8	3.4	5.0	9.9	3.2	4.7	15.3	4.0	6.5
Female									
Total	168,244	668,488	836,732	98,255	293,842	392,097	26,981	85,373	112,354
Never attended	39.5	56.1	52.7	35.7	43.7	41.7	36.7	54.9	50.5
Basic education	48.5	38.9	40.9	53.7	51.2	51.8	47.2	39.1	41.1
Secondary/vocational	8.3	4.1	4.9	7.5	4.1	5.0	9.7	4.5	5.8
Post-secondary diploma	0.6	0.2	0.3	0.5	0.2	0.3	1.0	0.2	0.4
Tertiary	3.1	0.8	1.2	2.6	0.8	1.3	5.3	1.2	2.2

Table 3.39: Persons 15 years or older engaged in agriculture by educational attainment and sex, and by type of agricultural activity and type of locality (cont'd)

Educational attainment/ Sex of holder	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	820	1,195	2,015	2,783	13,577	16,360	329	899	1,228	17,942	41,606	59,548
Never attended	9.1	20.5	15.9	22.3	33.0	31.2	14.0	36.3	30.3	47.0	46.7	46.8
Basic education	33.4	49.2	42.8	46.3	52.0	51.1	35.0	43.6	41.3	46.4	47.3	47.0
Secondary /Voc.	21.2	16.2	18.2	16.1	10.1	11.2	21.9	12.0	14.7	5.7	5.4	5.5
Post-Sec Diploma	3.2	2.1	2.5	2.3	0.7	1.0	3.6	1.4	2.0	0.3	0.1	0.2
Tertiary	33.0	12.1	20.6	12.9	4.1	5.6	25.5	6.7	11.7	0.6	0.5	0.6
Male												
Total	715	1,060	1,775	2,182	10,914	13,096	301	829	1,130	17,564	40,262	57,826
Never attended	7.4	18.8	14.2	18.3	28.2	26.6	12.3	34.9	28.8	46.9	46.4	46.6
Basic education	32.7	49.6	42.8	46.7	54.8	53.4	32.9	43.8	40.9	46.4	47.5	47.2
Secondary /Voc.	22.0	16.8	18.9	17.1	11.3	12.3	23.9	12.7	15.7	5.7	5.4	5.5
Post-Sec Diploma	3.1	2.2	2.5	2.7	0.8	1.1	4.0	1.6	2.2	0.3	0.2	0.2
Tertiary	34.8	12.6	21.6	15.2	4.9	6.6	26.9	7.1	12.4	0.6	0.5	0.6
Female												
Total	105	135	240	601	2,663	3,264	28	70	98	378	1,344	1,722
Never attended	21.0	34.1	28.3	36.8	52.8	49.8	32.1	52.9	46.9	50.3	55.4	54.2
Basic education	38.1	45.9	42.5	44.9	40.7	41.5	57.1	41.4	45.9	43.4	40.6	41.2
Secondary /Voc.	16.2	11.1	13.3	12.5	5.3	6.6	0.0	4.3	3.1	5.6	3.7	4.1
Post-Sec Diploma	3.8	1.5	2.5	1.2	0.3	0.5	0.0	0.0	0.0	0.3	0.0	0.1
Tertiary	21.0	7.4	13.3	4.7	0.9	1.6	10.7	1.4	4.1	0.5	0.3	0.3

Literacy status of persons engaged

Generally, majority (more than 50.0%) of persons engaged in various agricultural activities are literate except for those engaged in livestock (48.3%) and capture fisheries (45.8%). A similar pattern is observed for males, but for females, the proportion of holders who are literate is less than half for all types of agriculture except for holders engaged in aquaculture. The proportion of holders in urban and rural areas who are literate is also more than half except for holders in rural areas cultivating arable crops and rearing livestock as well as for holders engaged in capture fisheries, both in the urban and rural areas, where the proportion of the literate is less

than half. In all types of agriculture, the proportions of male holders who are literate are higher than females.

English with Ghanaian language and Ghanaian language only are the most common languages for which persons engaged in agriculture are literate. About a quarter of persons engaged in arable crop and livestock are literate in English with Ghanaian language, whereas for tree crop and forest tree, the proportion is about a third. The proportion literate in English with Ghanaian language among persons engaged in aquaculture and bee-keeping constitute the highest among all persons engaged in agriculture. A similar pattern is observed in both urban and rural areas with higher proportions in urban areas than in rural areas. The proportion literate in English with Ghanaian language is higher for males than females while the proportion literate in Ghanaian language only is higher for females than males for all types of agriculture (Table 3.40).

Table 3.40: Persons 15 years or older engaged in agriculture by literacy status, language of literacy, and sex, and by type of agricultural activity and type of locality

Literacy and sex	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes									
Total	499,318	1,861,084	2,360,402	282,477	910,513	1,192,990	102,329	342,416	444,745
Non-literate	37.4	52.6	49.4	32.0	42.3	39.9	33.4	57.1	51.7
Literate	62.6	47.4	50.6	68.0	57.7	60.1	66.6	42.9	48.3
Literate	312,497	881,857	1,194,354	192,183	525,376	717,559	68,100	146,766	214,866
English only	9.7	7.6	8.0	8.4	7.6	7.8	12.9	8.5	9.5
Ghanaian lang. only	15.2	15.9	15.7	16.3	17.5	17.2	11.8	12.4	12.3
Engl. and Gh'ian lang.	36.7	22.9	25.9	42.2	31.3	33.9	40.8	20.9	25.5
English and French	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1
Other languages	0.7	0.9	0.8	0.9	1.1	1.0	0.7	1.0	0.9
Male									
Total	331,074	1,192,596	1,523,670	184,222	616,671	800,893	75,348	257,043	332,391
Non-literate	31.4	47.5	44.0	23.3	35.1	32.4	29.0	54.7	48.9
Literate	68.6	52.5	56.0	76.7	64.9	67.6	71.0	45.3	51.1
Literate	227,116	625,650	852,766	141,333	400,221	541,554	53,483	116,402	169,885
English only	11.3	8.7	9.2	9.8	8.8	9.0	14.5	9.1	10.3
Ghanaian lang. only	13.4	15.4	15.0	14.5	17.5	16.8	10.2	12.4	11.9
Engl. and Gh'ian lang.	42.9	27.4	30.8	51.3	37.3	40.5	45.0	22.7	27.6
English and French	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Engl, Frch. & Gh'ian lang.	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.2
Other languages	0.7	0.8	0.8	0.8	1.1	1.1	0.9	1.0	1.0
Female									
Total	168,244	668,488	836,732	98,255	293,842	392,097	26,981	85,373	112,354
Non-literate	49.3	61.7	59.2	48.2	57.4	55.1	45.8	64.4	60.0
Literate	50.7	38.3	40.8	51.8	42.6	44.9	54.2	35.6	40.0
Literate	85,381	256,207	341,588	50,850	125,155	176,005	14,617	30,364	44,981
English only	6.7	5.7	6.0	5.8	5.2	5.3	8.6	6.6	7.0
Ghanaian lang. only	18.6	16.8	17.1	19.5	17.7	18.1	16.2	12.4	13.3
Engl. and Gh'ian lang.	24.5	14.9	16.8	25.3	18.7	20.5	28.6	15.6	18.7
English and French	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1
Other languages	0.7	0.9	0.9	1.0	1.0	1.0	0.5	1.0	0.9

Table 3.40: Persons 15 years or older engaged in agriculture by literacy status, language of literacy, and sex, and by type of agricultural activity and type of locality (*cont'd*)

Literacy and sex	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes												
Total	820	1,195	2,015	2,783	13,577	16,360	329	899	1,228	17,942	41,606	59,548
Non-literate	12.7	26.1	20.6	28.5	42.4	40	16.4	40.5	34	55.7	53.5	54.2
Literate	87.3	73.9	79.4	71.5	57.6	60	83.6	59.5	66	44.3	46.5	45.8
Literate	716	883	1,599	1,991	7,820	9,811	275	535	810	7,949	19,342	27,291
English only	12.8	11.3	11.9	10.1	8.5	8.8	9.1	10.3	10.0	8.1	7.9	7.9
Ghanaian lang. only	7.8	9.9	9.1	11.0	13.1	12.7	7.0	11.3	10.1	15.6	14.6	14.8
Engl. and Gh'ian lang.	65.4	51.4	57.2	49.1	35.2	37.5	65.0	36.8	44.3	20.2	22.9	22.1
English and French	0.1	0.4	0.2	0.0	0.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.5	0.4	0.4	0.4	0.1	0.2	1.3	0.2	0.5	0.1	0.0	0.1
Other languages	0.7	0.5	0.6	0.9	0.6	0.7	0.9	0.4	0.6	0.3	1.1	0.9
Male												
Total	715	1,060	1,775	2,182	10,914	13,096	301	829	1,130	17,564	40,262	57,826
Non-literate	10.6	24	18.6	24	37.9	35.6	14	38.7	32.1	55.7	53.3	54.1
Literate	89.4	76	81.4	76	62.1	64.4	86	61.3	67.9	44.3	46.7	45.9
Literate	639	806	1,445	1,659	6,777	8,436	259	508	767	7,786	18,785	26,571
English only	13.3	11.6	12.3	10.1	9.5	9.6	9.6	10.4	10.2	8.1	8.0	8.0
Ghanaian lang. only	7.6	9.8	8.9	10.1	12.5	12.1	5.7	11.0	9.6	15.6	14.3	14.7
Engl. and Gh'ian lang.	67.1	53.4	58.9	54.5	39.2	41.7	68.4	38.6	46.6	20.2	23.2	22.2
English and French	0.2	0.3	0.2	0.0	0.1	0.1	0.3	0.6	0.5	0.0	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.5	0.4	0.5	0.5	0.1	0.2	1.3	0.2	0.5	0.1	0.0	0.1
Other languages	0.7	0.5	0.6	0.8	0.7	0.7	0.7	0.5	0.5	0.3	1.2	0.9
Female												
Total	105	135	240	601	2,663	3,264	28	70	98	378	1,344	1,722
Non-literate	26.7	43	35.8	44.8	60.8	57.9	42.9	61.4	56.1	56.9	58.6	58.2
Literate	73.3	57	64.2	55.2	39.2	42.1	57.1	38.6	43.9	43.1	41.4	41.8
Literate	77	77	154	332	1,043	1,375	16	27	43	163	557	720
English only	9.5	8.9	9.2	10.5	4.4	5.6	3.6	8.6	7.2	6.6	4.2	4.8
Ghanaian lang. only	9.5	10.4	10.0	14.3	15.4	15.2	21.4	14.3	16.3	15.9	21.8	20.5
Engl. and Gh'ian lang.	53.3	36.3	43.8	29.6	18.9	20.8	28.5	15.7	19.4	20.6	15.3	16.5
English and French	0.0	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other languages	1.0	0.7	0.8	0.8	0.5	0.5	3.6	0.0	1.0	0.0	0.1	0.0

3.5.6 Nationality of persons engaged in agricultural activity

The proportion of non-Ghanaians engaged in agriculture is highest in livestock rearing. The majority of non-Ghanaians engaged in both arable and tree cropping are Togolese (46.3%, 41.2%) and Burkinabes (22.8%, 21.9%) respectively. In the case of livestock rearing, Burkinabes (40.7%) dominate Togolese with (16.7%), see Table 3.41.

Table 3.41: Persons 15 years or older engaged in agriculture by nationality, and by type of agricultural activity

Nationality	Arable crops	%	Tree crops	%	Livestock	%	Aquaculture	%
Total	2,360,402		1,192,990		444,745		2,015	
Ghanaian	2,353,426	99.7	1,190,585	99.8	442,124	99.4	2,006	99.6
Non-Ghanaian	6,976	0.3	2,405	0.2	2,621	0.6	9	0.4
Non-Ghanaian	6,976	100.0	2,405	100.0	2,621	100.0	9	100.0
Burkinabe	1,594	22.8	527	21.9	1,066	40.7	0	0.0
Ivoirian	470	6.7	361	15	99	3.8	2	22.2
Nigerian	241	3.5	72	3	157	6	4	44.4
Togolese	3,232	46.3	990	41.2	437	16.7	0	0.0
Other African	1,398	20	446	18.5	847	32.3	1	11.1
Non-African	41	0.6	9	0.4	15	0.6	2	22.2

Note: An individual may engage in more than one agricultural activity

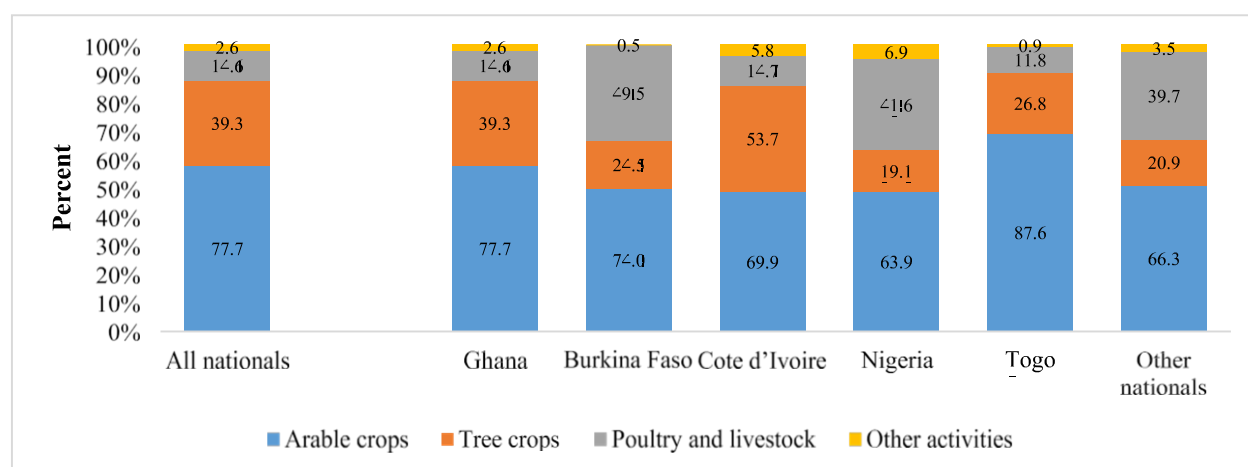
Table 3.41: Persons 15 years or older engaged in agriculture by nationality, and by type of agricultural activity (cont'd)

<u>Nationality</u>	<u>Forest trees</u>	<u>%</u>	<u>Bee-keeping</u>	<u>%</u>	<u>Capture fisheries</u>	<u>%</u>	<u>Population engaged in at least one activity</u>
Total	16,360		1,228		59,548		3,037,381.0
Ghanaian	16,324	99.8	1,222	99.5	59,412	99.8	3,028,319
Non-Ghanaian	36	0.2	6	0.5	136	0.2	9,062
Non-Ghanaian	36	100.0	6	100.0	136	100.0	9,062
Burkinbe	7	19.4	0	0.0	5	3.7	2,153
Ivoirian	6	16.7	0	0.0	31	22.8	672
Nigerian	3	8.3	0	0.0	19	14.0	377
Togolese	12	33.3	4	66.7	19	14.0	3,688
Other African	7	19.4	2	33.3	62	45.6	2,117
Non-African	1	2.8	0	0.0	0	0.0	55

Note: An individual may engage in more than one agricultural activity

Arable cropping (77.7%) is the main agricultural activity of Ghanaian agricultural household members (Figure 3.7). The other two prevailing agricultural activities by Ghanaian are tree cropping (39.3%), and livestock rearing (14.6%). For non-Ghanaians, the key activities are arable crop farming (77.0%), livestock rearing (28.9%) and tree cropping (26.5%). Whereas a higher proportion of Ivoirians engage in tree cropping (53.7%), Burkinabes are more engaged in livestock rearing (49.5%).

Figure 3.7: Nationality of persons in agricultural households 15 years or older by type of agricultural activity (percent)



Note: An individual may engage in more than one activity

3.5.7 Disability status of persons engaged in various agricultural activities

The proportion of persons engaged in the cultivation of forest trees who have some form of disability is 2.2 percent while the proportion for all other types of agriculture is less than 2 percent in both urban and rural areas with the least being persons engaged in capture fisheries (0.6%). A similar pattern is observed for urban and rural areas for each type of agricultural activities and for males and females. However, for males the proportions are relatively higher among persons engaged in forest tree (2.0%), bee-keeping (1.8%) and 1.5 percent for persons engaged in tree cropping and aquaculture. For females, the proportions are relatively higher for

persons engaged in forest tree (3.0%), tree cropping (2.1%) and livestock (1.5%), see (Table 3.42).

Table 3.42: Persons 15 years or older engaged in agriculture by disability status and sex, and by type of agricultural activity and type of locality

Disability status	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total	499,318	1,861,084	2,360,402	282,477	910,513	1,192,990	102,329	342,416	444,745
Without Disability	98.9	98.8	98.8	98.1	98.4	98.3	98.8	98.5	98.6
With Disability	1.1	1.2	1.2	1.9	1.6	1.7	1.2	1.5	1.4
Male									
Total	331,074	1,192,596	1,523,670	184,222	616,671	800,893	75,348	257,043	332,391
Without Disability	99.1	98.8	98.9	98.3	98.5	98.5	98.9	98.5	98.6
With Disability	0.9	1.2	1.1	1.7	1.5	1.5	1.1	1.5	1.4
Female									
Total	168,244	668,488	836,732	98,255	293,842	392,097	26,981	85,373	112,354
Without Disability	98.7	98.7	98.7	97.5	98.1	97.9	98.4	98.5	98.5
With Disability	1.3	1.3	1.3	2.5	1.9	2.1	1.6	1.5	1.5

Table 3.42: Persons 15 years or older engaged in agriculture by disability status and sex, and by type of agricultural activity and type of locality (cont'd)

Disability status	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes												
Total	820	1,195	2,015	2,783	13,577	16,360	329	899	1,228	17,942	41,606	59,548
Without Disability	98.2	98.9	98.6	96.7	98.1	97.8	98.2	98.3	98.3	99.5	99.3	99.4
With Disability	1.8	1.1	1.4	3.3	1.9	2.2	1.8	1.7	1.7	0.5	0.7	0.6
Male												
Total	715	1,060	1,775	2,182	10,914	13,096	301	829	1,130	17,564	40,262	57,826
Without Disability	97.9	99.0	98.5	97.4	98.2	98.0	98.0	98.3	98.2	99.5	99.3	99.4
With Disability	2.1	1.0	1.5	2.6	1.8	2.0	2.0	1.7	1.8	0.5	0.7	0.6
Female												
Total	105	135	240	601	2,663	3,264	28	70	98	378	1,344	1,722
Without Disability	100.0	98.5	99.2	94.0	97.7	97.0	100.0	98.6	99.0	99.2	98.9	99.0
With Disability	0.0	1.5	0.8	6.0	2.3	3.0	0.0	1.4	1.0	0.8	1.1	1.0

Types of disability of persons engaged in various agricultural activities

For all types of agricultural activities, physical and sight conditions are the most common types of disability conditions among persons engaged in agriculture. The total responses of persons cultivating arable crops who have some form of disability is 40,894 of which those with physical (44.6%) and sight (25.8%) challenges constitute the highest proportions with a similar pattern in both urban and rural areas and for all types of crops. Among females engaged in agriculture, the proportion of persons with physical challenges is slightly higher than their male counterparts, while for the other forms of disability conditions, males have higher conditions than females. This observation is consistent across all types of crops in urban and rural areas. (Table 3.43).

Table 3.43: Persons 15 years or older engaged in agriculture by type of disability and sex, and by type of agricultural activity and type of locality

Type of disability	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total responses*	8,284	32,601	40,894	7,703	20,338	28,042	1,793	6,543	8,339
Sight	25.7	25.8	25.8	24.3	25.7	25.3	26.7	26.3	26.4
Hearing	15.8	16.3	16.2	12.3	12.6	12.5	13.4	13.7	13.7
Speech	13.6	13.4	13.4	10.1	10.9	10.7	10.6	9.9	10.1
Physical	44.9	44.5	44.6	53.2	50.8	51.5	49.3	50.1	49.9
Males									
Total responses	5,057	20,308	25,375	4,460	12,600	17,063	1,220	4,963	6,186
Sight	26.2	26.5	26.5	25.2	26.4	26.1	27.1	26.0	26.3
Hearing	16.2	16.1	16.2	12.9	12.6	12.6	13.7	13.9	13.9
Speech	14.6	13.9	14.0	11.7	11.4	11.5	11.6	10.6	10.8
Physical	43.0	43.5	43.4	50.2	49.6	49.8	47.6	49.4	49.0
Females									
Total responses	3,227	12,293	15,519	3,243	7,738	10,979	573	1,580	2,153
Sight	25.1	24.6	24.7	23.1	24.5	24.0	25.8	27.0	26.7
Hearing	15.1	16.5	16.3	11.5	12.7	12.4	12.7	13.2	13.1
Speech	11.9	12.5	12.4	8.0	10.1	9.5	8.6	7.7	8.0
Physical	47.9	46.3	46.7	57.4	52.7	54.1	52.9	52.1	52.2

*A person could have more than one form of disability.

Table 3.43: Persons 15 years or older engaged in agriculture by type of disability and sex, and by type of agricultural activity and type of locality (cont'd)

Type of disability	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes												
Total responses*	40	21	61	125	306	431	12	17	29	118	380	498
Sight	22.5	28.6	24.6	21.6	32.7	29.5	33.3	17.6	24.1	36.4	33.4	34.1
Hearing	20.0	9.5	16.4	8.0	6.2	6.7	16.7	5.9	10.3	17.8	19.2	18.9
Speech	22.5	9.5	18.0	10.4	6.5	7.7	16.7	0.0	6.9	14.4	11.3	12.0
Physical	35.0	52.4	41.0	60.0	54.6	56.1	33.3	76.5	58.6	31.4	36.1	34.9
Male												
Total responses	40	15	55	79	223	302	12	16	28	115	360	475
Sight	22.5	26.7	23.6	24.1	32.7	30.5	33.3	18.8	25.0	35.7	34.7	34.9
Hearing	20.0	6.7	16.4	7.6	4.5	5.3	16.7	6.3	10.7	18.3	18.3	18.3
Speech	22.5	6.7	18.2	8.9	6.3	7.0	16.7	0.0	7.1	14.8	11.4	12.2
Physical	35.0	60.0	41.8	59.5	56.5	57.3	33.3	75.0	57.1	31.3	35.6	34.5
Female												
Total responses	0	6	6	46	83	129	0	1	1	3	20	23
Sight	0.0	33.3	33.3	17.4	32.5	27.1	0.0	0.0	0.0	66.7	10.0	17.4
Hearing	0.0	16.7	16.7	8.7	10.8	10.1	0.0	0.0	0.0	0.0	35.0	30.4
Speech	0.0	16.7	16.7	13.0	7.2	9.3	0.0	0.0	0.0	0.0	10.0	8.7
Physical	0.0	33.3	33.3	60.9	49.4	53.5	0.0	100	100	33.3	45.0	43.5

*A person could have more than one form of disability.

3.6 Socio-economic characteristics of holders

3.6.1 Type of agricultural activities of holders

About 2.2 million persons 15 years or older engaged in agriculture are holders. Of the total holders, 80.4 percent are engaged in arable crop farming, 35.5 percent are engaged in tree crop farming and 15.0 percent are engaged in livestock rearing. Holders are dominated by males (1,551,265), representing 71.2 percent. Aquaculture, forest trees and bee-keeping are not popular agricultural activities, yet,

Holders may engage in more than one agricultural activity. In the case of holders engaged in two or more activities, the activity which contributes most to the farmer's total production is considered the main.

similar to the main agricultural activities, male holders still dominate (more than 84 percent) compared to females in these less popular agricultural activities (Table 3.44).

Table 3.44: Agricultural holders 15 years or older by type of agricultural activity and by sex

Type of activity	Male	%	Female	%	Total	%
Total	1,551,265	100.0	607,432	100.0	2,158,697	100.0
Arable crops	1,243,834	80.2	492,606	81.1	1,736,440	80.4
Tree crops	571,741	36.9	194,144	32.0	765,885	35.5
Livestock	264,791	17.1	58,834	9.7	323,625	15.0
Aquaculture	1,149	0.1	63	0.0	1,212	0.1
Forest trees	9,848	0.6	1,833	0.3	11,681	0.5
Bee-keeping	1,005	0.1	68	0.0	1,073	0.0
Capture fisheries	12,941	0.8	215	0.0	13,156	0.6

3.6.2 Age of holders engaged in agricultural activity

Holders in the 36-59 age group dominate in all agricultural activities. The 36-59 age group constitutes more than half (57.0%) of all holders in agriculture. This is followed by persons aged 60 years or older, except for arable crops and capture fisheries where the 25-35 year age group comes second. The distribution of males in the various age groups for the urban-rural distribution is mixed. For instance, 59.9 percent of urban male and 56.3 percent of rural male engage in arable crop farming. Conversely, nearly a quarter of males in the rural areas aged 25-35 are into arable crop production compared to a little over a fifth of males in the urban centres. A similar pattern is also observed among females for all age groups and agricultural activities (Table 3.45).

Table 3.45: Agricultural holders 15 years or older by age and sex, and by type of agricultural activity and type of locality

Age	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes									
Total	376,374	1,360,066	1,736,440	178,142	587,743	765,885	75,632	247,993	323,625
15-19	0.2	0.4	0.4	0.1	0.1	0.1	0.3	0.3	0.3
20-24	1.4	2.5	2.3	0.7	1.0	1.0	1.1	1.6	1.5
25-35	21.2	23.3	22.8	13.7	16.2	15.6	17.7	19	18.7
36-59	59.9	56.2	57.0	60.5	60.4	60.4	60.4	58.2	58.8
60+	17.3	17.5	17.5	25.0	22.3	23.0	20.5	20.9	20.8
Male									
Total	267,598	976,236	1,243,834	127,044	444,697	571,741	57,817	206,974	264,791
15-19	0.2	0.5	0.4	0.1	0.1	0.1	0.3	0.3	0.3
20-24	1.6	2.6	2.4	0.8	1.1	1.1	1.3	1.7	1.6
25-35	22.8	24.9	24.5	15	17.8	17.2	19.1	20.5	20.2
36-59	60.1	56.3	57.1	61.5	61	61.1	61.2	58.2	58.9
60+	15.2	15.7	15.6	22.6	20	20.6	18.1	19.2	19
Female									
Total	108,776	383,830	492,606	51,098	143,046	194,144	17,815	41,019	58,834
15-19	0.1	0.4	0.3	0	0.1	0.1	0.2	0.1	0.1
20-24	1.1	2.2	1.9	0.6	0.7	0.7	0.7	0.8	0.8
25-35	17.1	19.2	18.7	10.6	11.3	11.1	12.9	11.3	11.8
36-59	59.2	56.1	56.8	57.9	58.4	58.3	58	58.3	58.2
60+	22.4	22.2	22.2	30.8	29.5	29.9	28.3	29.5	29.1

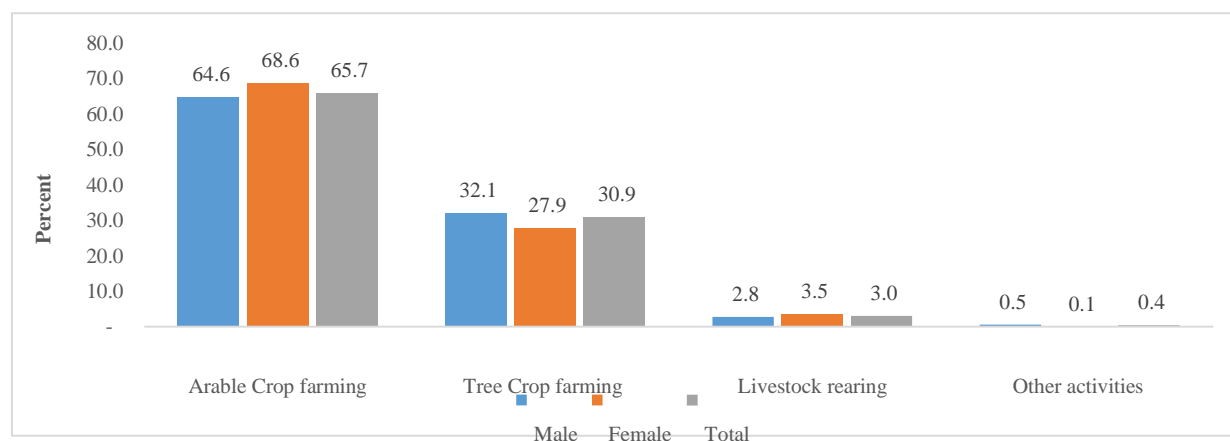
Table 3.45: Agricultural holders 15 years or older by age and sex, and by type of agricultural activity and type of locality (cont'd)

Age	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes												
Total	469	743	1,212	1,687	9,994	11,681	250	823	1,073	1,210	11,946	13,156
15-19	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.1	0.2	0.2	0.3	0.3
20-24	1.1	1.3	1.2	0.4	0.8	0.7	0.8	1.9	1.7	1.4	2.5	2.4
25-35	14.9	17.2	16.3	7.8	13.6	12.7	14.8	19.7	18.5	19.8	25.7	25.1
36-59	65.7	63.9	64.6	60.2	61.2	61.1	58.4	58.2	58.2	65.5	59.6	60.1
60+	18.3	17.5	17.8	31.6	24.3	25.4	25.6	20.0	21.3	13.2	12.0	12.1
Male												
Total	433	716	1,149	1,402	8,446	9,848	235	770	1,005	1,175	11,766	12,941
15-19	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.0	0.1	0.2	0.3	0.3
20-24	1.2	1.0	1.0	0.4	0.9	0.8	0.9	1.9	1.7	1.3	2.5	2.4
25-35	15.2	17.2	16.4	8.1	14.3	13.4	15.7	19.9	18.9	19.7	25.9	25.3
36-59	65.4	64.1	64.6	60.7	61.7	61.5	57.0	57.8	57.6	65.9	59.5	60.1
60+	18.2	17.7	17.9	30.9	23.1	24.2	26.0	20.4	21.7	13.0	11.9	12.0
Female												
Total	36	27	63	285	1,548	1,833	15	53	68	35	180	215
15-19	0.0	0.0	0.0	0.4	0.0	0.1	0.0	1.9	1.5	0.0	0.0	0.0
20-24	0.0	11.1	4.8	0.4	0.3	0.3	0.0	1.9	1.5	5.7	1.7	2.3
25-35	11.1	18.5	14.3	6.3	9.6	9.1	0.0	17.0	13.2	22.9	12.2	14.0
36-59	69.4	59.3	65.1	57.9	58.9	58.8	80.0	64.2	67.6	51.4	65.6	63.3
60+	19.4	11.1	15.9	35.1	31.1	31.8	20.0	15.1	16.2	20.0	20.6	20.5

3.6.3 Main activity of agricultural holders

The main activity of the majority (65.7%) of all agricultural holders is arable cropping followed by tree cropping (30.9%). Only 3 percent of agricultural holders are mainly engaged in livestock rearing (Figure 3.8). Whereas a slightly higher proportion of female holders (68.6%) than male holders (65.7%) are mainly engaged in arable crop farming, the reverse is the case for holders mainly engaged in tree crop farming (of which males account for 32.1 percent and females 27.9 percent).

Figure 3.8: Type of main agricultural activity of holders 15 years or older by sex



There is an overwhelming dominance (more than 90%) of male holders engaged in capture fisheries, aquaculture and bee-keeping. This male dominance is relatively reduced to an average of 70 percent for poultry, arable and tree crops. A similar pattern is observed for holders in urban and rural areas (Table 3.46).

Table 3.46: Agricultural holders 15 years or older by main activity, and by type of locality and sex

Main activity of holders	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	71.0	29.0	502,098	72.1	27.9	1,656,599	71.9	28.1	2,158,697
Arable crop	70.8	29.2	309,715	70.6	29.4	1,109,364	70.7	29.3	1,419,079
Tree crop	71.4	28.6	152,812	75.6	24.4	514,187	74.6	25.4	666,999
Livestock	70.2	29.8	38,139	62.3	37.7	25,909	67.0	33.0	64,048
Aquaculture	91.5	8.5	271	95.7	4.3	281	93.7	6.3	552
Forestry tree	78.2	21.8	436	81.8	18.2	1,071	80.8	19.2	1,507
Bee-keeping	91.5	8.5	82	90.5	9.5	95	91.0	9.0	177
Capture fisheries	96.6	3.4	643	98.8	1.2	5,692	98.6	1.4	6,335

3.6.4 Multiple agricultural activity of holders

About 71 percent of the total number (2,158,697) of holders are engaged in only a single agricultural activity while about a quarter (25.7%) are engaged in two agricultural activities with the remaining 3.1 percent engaged in three or more agricultural activities. Whereas the proportion engaged in a single activity declines with age, holders involved in two or more activities increase with age. A similar pattern applies to males and females as well as to urban and rural areas, except for male holders in the rural areas (Table 3.47).

Table 3.47: Agricultural holders 15 years or older by age and sex, and by number of agricultural activities and type of locality

Sex and age	Urban					Rural					Total				
	Number of major agricultural activities					Number of major agricultural activities					Number of major agricultural activities				
	1	2	3	4+	Total	1	2	3	4+	Total	1	2	3	4+	Number
Both Sexes															
Total	76	21.9	2.1	0.1	502,098	69.7	26.8	3.3	0.2	1,656,599	71.2	25.7	3	0.1	2,158,697
15-19	94	5.8	0.2	0	961	89.8	9.8	0.4	0	6,405	90.4	9.3	0.4	0.2	7,366
20-24	87.5	11.9	0.6	0	6,741	83.6	15.3	1	0	37,736	84.2	14.8	1	0.9	44,477
25-35	83	15.9	1.1	0	100,024	76.2	21.7	2.1	0.1	367,921	77.6	20.4	1.8	0.4	467,945
36-59	75.1	22.6	2.2	0.1	299,516	68	28.1	3.7	0.2	939,575	69.8	26.8	3.3	0.1	1,239,091
60+	70.3	26.7	2.9	0.1	94,856	64.8	30.9	4.1	0.2	304,962	66.1	29.9	3.8	0	399,818
Male															
Total	74.6	22.9	2.4	0.1	356,383	66.2	29.7	3.9	0.2	1,194,882	68.2	28.1	3.5	0.2	1,551,265
15-19	93.6	6.1	0.3	0	783	87.8	11.7	0.5	0	4,963	88.6	11	0.5	0	5,746
20-24	86.5	12.7	0.8	0	5,236	80.3	18.4	1.2	0.1	28,615	81.3	17.5	1.2	0.1	33,851
25-35	81.5	17.3	1.2	0	76,550	72.6	24.9	2.4	0.1	283,890	74.5	23.3	2.2	0.1	360,440
36-59	73.6	23.8	2.5	0.1	214,212	64.5	31	4.3	0.2	680,228	66.7	29.2	3.9	0.2	894,440
60+	68.3	28.2	3.4	0.1	59,602	60.5	34.4	4.9	0.2	197,186	62.3	32.9	4.6	0.2	256,788
Female															
Total	79.3	19.3	1.4	0	145,715	78.7	19.3	1.9	0.1	461,717	78.8	19.3	1.8	0	607,432
15-19	95.5	4.5	0	0	178	96.8	3.2	0	0	1,442	96.7	3.3	0	0	1,620
20-24	90.9	8.9	0.2	0	1,505	93.9	5.7	0.4	0	9,121	93.5	6.2	0.3	0	10,626
25-35	88.1	11.4	0.5	0	23,474	88.3	10.8	0.8	0	84,031	88.3	11	0.7	0	107,505
36-59	78.9	19.6	1.5	0	85,304	77.3	20.5	2.1	0.1	259,347	77.7	20.3	1.9	0.1	344,651
60+	73.8	24.2	2.1	0	35,254	72.8	24.5	2.7	0	107,776	73	24.4	2.5	0	143,030

Note: Major groups comprise aquaculture, capture fisheries, arable crops, tree crops, livestock, and forest trees.

3.6.5 Educational attainment and literacy status of holders

Among the various types of agricultural activities, livestock, arable crop, and capture fisheries have the highest number of holders who have never attended school with proportions of 49.7 percent, 46.7 percent and 42.0 percent respectively.

The involvement of holders in agriculture who have attained tertiary level of education is minimal for all activities with the exception of aquaculture and bee-keeping, where 22.9 percent and 11.2 percent of the holders, respectively, have tertiary education (Table 3.48).

Table 3.48: Agricultural holders 15 years or older by educational attainment and sex, and by type of agricultural activity and type of locality

Educational attainment/ Sex of holder	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total	376,374	1,360,066	1,736,440	178,142	587,743	765,885	75,632	247,993	323,625
Never attended	32.9	50.5	46.7	21.1	29.2	27.3	29.7	55.9	49.7
Basic education	45.4	40.0	41.2	58.9	60.4	60.0	41.2	34.0	35.7
Secondary/Voc.	12.1	6.4	7.6	12.0	7.4	8.5	14.4	6.1	8.0
Post-Sec. Diploma	1.0	0.4	0.5	1.0	0.5	0.6	1.5	0.5	0.7
Tertiary	8.5	2.7	4.0	7.0	2.6	3.6	13.1	3.6	5.8
Male									
Total	267,598	976,236	1,243,834	127,044	444,697	571,741	57,817	206,974	264,791
Never attended	29.8	47.4	43.6	14.5	23.8	21.7	26.8	55.5	49.2
Basic education	44.0	40.8	41.5	60.7	63.6	63.0	39.6	33.2	34.6
Secondary/Voc.	14.3	7.8	9.2	14.5	8.8	10.1	16.4	6.8	8.9
Post-Sec. Diploma	1.2	0.5	0.6	1.2	0.6	0.7	1.7	0.5	0.8
Tertiary	10.7	3.5	5.0	9.0	3.2	4.5	15.5	4.1	6.6
Female									
Total	108,776	383,830	492,606	51,098	143,046	194,144	17,815	41,019	58,834
Never attended	40.6	58.4	54.4	37.4	45.9	43.7	39.2	57.7	52.1
Basic education	48.9	37.9	40.3	54.2	50.2	51.3	46.4	38.0	40.5
Secondary/Voc.	6.8	2.8	3.7	5.8	2.9	3.7	8.1	2.7	4.3
Post-Sec. Diploma	0.5	0.2	0.3	0.4	0.2	0.2	0.9	0.3	0.5
Tertiary	3.2	0.8	1.3	2.2	0.8	1.1	5.5	1.4	2.6

Table 3.48: Agricultural holders 15 years or older by educational attainment and sex, and by type of agricultural activity and type of locality (cont'd)

Educational attainment/ Sex of holder	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes												
Total	469	743	1,212	1,687	9,994	11,681	250	823	1,073	1,210	11,946	13,156
Never attended	6.0	15.5	11.8	19.4	31.4	29.7	13.2	36.7	31.2	32.2	42.9	42.0
Basic educ	34.3	51.5	44.9	52.2	54.9	54.5	37.2	43.5	42.0	57.2	50.1	50.8
Sec/Voc	19.8	16.6	17.8	13.4	8.9	9.6	20.4	11.7	13.7	7.9	5.9	6.1
Post-Sec. Dipl.	4.1	1.6	2.6	2.2	0.7	0.9	3.6	1.3	1.9	0.7	0.2	0.3
Tertiary	35.8	14.8	22.9	12.9	4.0	5.3	25.6	6.8	11.2	1.9	0.8	0.9
Male												
Total	433	716	1,149	1,402	8,446	9,848	235	770	1,005	1,175	11,766	12,941
Never attended	4.8	14.5	10.9	15.5	27.1	25.5	11.1	35.1	29.5	31.7	42.6	41.6
Basic educ	34.9	51.8	45.4	52.6	57.4	56.7	36.6	44.0	42.3	57.5	50.4	51.1
Sec/Voc	19.9	16.9	18.0	14.9	10.1	10.8	21.7	12.3	14.5	8.0	6.0	6.2
Post-Sec. Dipl.	3.5	1.5	2.3	2.5	0.7	1.0	3.8	1.4	2.0	0.8	0.2	0.3
Tertiary	37.0	15.2	23.4	14.4	4.6	6.0	26.8	7.1	11.7	2.0	0.8	0.9
Female												
Total	36	27	63	285	1,548	1,833	15	53	68	35	180	215
Never attended	19.4	40.7	28.6	38.2	55.0	52.4	46.7	60.4	57.4	48.6	66.1	63.3
Basic educ	27.8	44.4	34.9	49.8	41.4	42.7	46.7	35.8	38.2	45.7	31.1	33.5
Sec/Voc	19.4	7.4	14.3	6.0	2.5	3.0	0.0	1.9	1.5	5.7	2.8	3.3
Post-Sec. Dipl.	11.1	3.7	7.9	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Tertiary	22.2	3.7	14.3	5.3	1.0	1.7	6.7	1.9	2.9	0.0	0.0	0.0

Literacy status of holders

About 83 percent of aquaculture holders are literate in at least one language and this constitutes the highest literacy rate of agricultural holders. The next highest rate is among holders engaged in capture fisheries (65.1%) and those cultivating tree crops (62.5%). Holders engaged in livestock and arable crops have the lowest literacy rate (46.9% and 50.5% respectively), see Table 3.50.

More than half of the holders can read and write in both English and a Ghanaian language with higher proportions in urban areas than in rural areas. In addition, the proportion of male holders who are literate is higher than that of female holders (Table 3.49).

Table 3.49: Agricultural holders 15 years or older by literacy status, language and sex, and by type of agricultural activity and type of locality

Literacy/ Sex of holder	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both Sexes	376,374	1,360,066	1,736,440	178,142	587,743	765,885	75,632	247,993	323,625
Non-literate	37.7	52.6	49.4	30.8	39.4	37.4	34.6	58.6	53.0
Literate	62.3	47.4	50.6	69.2	60.6	62.6	65.4	41.4	47.0
Literate	234,481	644,671	879,152	123,273	356,172	479,445	49,462	102,669	152,131
English only	15.2	14.1	14.4	12.0	11.9	11.9	20.6	18.8	19.4
Ghanaian lang. only	25.2	35.9	33.0	23.8	31.5	29.5	17.3	31.4	26.8
Engl. and Gh'ian lang.	58.1	47.9	50.6	62.4	54.6	56.6	60.6	47.1	51.5
English and French	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
Engl, Frch. & Gh'ian lang.	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.3
Other languages	1.0	1.7	1.5	1.3	1.7	1.6	1.1	2.2	1.8
Male									
Total	267,598	976,236	1,243,834	127,044	444,697	571,741	57,817	206,974	264,791
Non-literate	32.9	49.2	45.7	23.4	33.9	31.6	30.3	57.1	51.2
Literate	67.1	50.8	54.3	76.6	66.1	68.4	69.7	42.9	48.8
Literate	179,559	495,928	675,487	97,316	293,945	391,261	40,298	88,793	129,091
English only	16.4	15.4	15.6	12.7	12.7	12.7	21.5	19.8	20.3
Ghanaian lang. only	20.6	31.3	28.4	19.5	27.7	25.6	14.1	29.4	24.6
Engl. and Gh'ian lang.	61.7	51.6	54.3	66.4	57.8	59.9	62.7	48.5	52.9
English and French	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2
Engl, Frch. & Gh'ian lang.	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.3
Other languages	0.9	1.4	1.2	1.0	1.5	1.4	1.1	1.9	1.6
Female									
Total	108,776	383,830	492,606	51,098	143,046	194,144	17,815	41,019	58,834
Non-literate	49.4	61.9	59.1	49.6	56.9	55.0	48.9	66.7	61.3
Literate	50.6	38.1	40.9	50.4	43.1	45.0	51.1	33.3	38.7
Literate	55,041	146,240	201,281	25,754	61,653	87,407	9,103	13,660	22,763
English only	11.5	10.0	10.4	9.3	8.4	8.6	17.2	12.9	14.6
Ghanaian lang. only	40.7	51.7	48.7	40.5	49.7	46.9	31.3	44.7	39.4
Engl. and Gh'ian lang.	46.6	36.0	38.9	47.8	39.7	42.1	50.7	39.6	44.1
English and French	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.2	0.0	0.1	0.2	0.0	0.1	0.2	0.0	0.1
Other languages	1.0	2.4	2.0	2.2	2.3	2.3	0.6	2.7	1.9

Table 3.49: Agricultural holders 15 years or older by literacy status, language and sex, and by type of agricultural activity and type of locality (*cont'd*)

Literacy/ Sex of holder	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	469	743	1,212	1,687	9,994	11,681	250	823	1,073	1,210	11,946	13,156
Non-literate	10.0	22.2	17.5	27.3	42.6	40.4	16.0	40.6	34.9	46.0	51.9	51.4
Literate	90.0	77.8	82.5	72.7	57.4	59.6	84.0	59.4	65.1	54.0	48.1	48.6
Literate	422	578	1000	1226	5736	6962	210	489	699	653	5746	6399
<i>English only</i>	14.7	11.8	13.0	10.8	14.8	14.1	11.9	18.0	16.2	15.3	19.5	19.1
<i>Ghanaian lang. only</i>	5.5	11.1	8.7	17.4	22.8	21.9	7.1	19.2	15.6	18.7	26.0	25.2
<i>Engl. and Gh'ian lang.</i>	78.4	75.8	76.9	71.0	61.0	62.7	77.6	60.7	65.8	64.6	51.6	52.9
<i>English and French</i>	0.2	0.5	0.4	0.0	0.2	0.1	0.5	1.0	0.9	0.0	0.0	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.5	0.5	0.5	0.7	0.2	0.3	1.9	0.4	0.9	0.3	0.0	0.0
<i>Other languages</i>	0.7	0.3	0.5	0.2	1.0	0.9	1.0	0.6	0.7	1.1	2.9	2.7
Male												
Total	433	716	1,149	1,400	8,445	9,845	235	770	1,005	1,175	11,766	12,941
Non-literate	9.0	21.6	16.9	22.6	38.5	36.3	13.2	39.0	32.9	45.5	51.7	51.1
Literate	91.0	78.4	83.1	77.4	61.5	63.7	86.8	61.0	67.1	54.5	48.3	48.9
Literate	394	561	955	1083	5193	6276	204	470	674	640	5683	6323
<i>English only</i>	15.0	11.2	12.8	9.6	15.4	14.4	12.3	17.9	16.2	15.5	19.7	19.2
<i>Ghanaian lang. only</i>	5.3	11.2	8.8	15.1	20.7	19.7	6.4	18.1	14.5	18.4	25.9	25.1
<i>Engl. and Gh'ian lang.</i>	78.2	76.5	77.2	74.1	62.4	64.5	78.4	61.9	66.9	64.7	51.6	52.9
<i>English and French</i>	0.3	0.4	0.3	0.0	0.2	0.1	0.5	1.1	0.9	0.0	0.0	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.5	0.5	0.5	0.7	0.2	0.3	2.0	0.4	0.9	0.3	0.0	0.0
<i>Other languages</i>	0.8	0.2	0.4	0.4	1.1	1.0	0.5	0.6	0.6	1.1	2.9	2.7
Female												
Total	36	27	63	285	1,549	1,834	15	53	68	35	180	215
Non-literate	22.2	37.0	28.6	50.2	65.1	62.8	60.0	64.2	63.2	60.0	66.7	65.6
Literate	77.8	63.0	71.4	49.8	34.9	37.2	40.0	35.8	36.8	40.0	33.3	34.4
Literate	28	17	45	142	540	682	6	19	25	14	60	74
<i>English only</i>	10.7	29.4	17.8	19.7	7.4	10.0	0.0	21.1	16.0	14.3	1.7	4.1
<i>Ghanaian lang. only</i>	7.1	5.9	6.7	34.5	45.9	43.5	33.3	47.4	44.0	28.6	63.3	56.8
<i>Engl. and Gh'ian lang.</i>	82.1	52.9	71.1	45.8	45.9	45.9	50.0	31.6	36.0	57.1	33.3	37.8
<i>English and French</i>	0.0	5.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other languages</i>	0.0	5.9	2.2	0.0	0.4	0.3	16.7	0.0	4.0	0.0	1.7	1.4

3.6.6 Nationality status of holders

The proportion of non-Ghanaian holders is highest among bee-keeping (0.9%). Non-Ghanaians engaged in agriculture are mainly holders of arable crops, tree crops and livestock and their activities are mostly in the rural areas. Among the non-Ghanaian holders who cultivate arable and tree crops, the Togolese form the highest proportion in both arable and tree cropping (49.6% and 43.6% respectively); followed by the Burkinabes (20.3% and 18.5% respectively). For livestock, the Burkinabes form the highest proportion (39.3%) while the Togolese (19.4%) are the second highest with proportions higher in rural than in urban areas. (Table 3.50).

Table 3.50: Agricultural holders 15 years or older by nationality, and by type of agricultural activity and type of locality

Nationality	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	376,374	1,360,066	1,736,440	178,142	587,743	765,885	75,632	247,993	323,625
Ghanaian	375,396	1,355,839	1,731,235	177,942	586,596	764,538	75,257	246,774	322,031
Non-Ghanaian	978	4,227	5,205	200	1,147	1,347	375	1,219	1,594
% Ghanaian	99.7	99.7	99.7	99.9	99.8	99.8	99.5	99.5	99.5
% non-Ghanaian	0.3	0.3	0.3	0.1	0.2	0.2	0.5	0.5	0.5
Non-Ghanaian	978	4,227	5,205	200	1,147	1,347	375	1,219	1,594
Burkinabe	13.7	21.8	20.3	13.0	19.4	18.5	28.0	42.7	39.3
Ivoirian	7.1	5.5	5.8	18.0	13.9	14.5	4.5	3.7	3.9
Nigerian	5.4	3.1	3.6	8.0	2.5	3.3	10.9	5.7	6.9
Togolese	47.9	50.0	49.6	35.0	45.1	43.6	17.1	20.1	19.4
Other African	24.6	19.3	20.3	25.0	19.0	19.9	38.1	27.4	29.9
Non-African	1.3	0.3	0.5	1.0	0.1	0.2	1.3	0.4	0.6

Table 3.50: Agricultural holders 15 years or older by nationality, and by type of agricultural activity and type of locality (cont'd)

Nationality	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	469	743	1,212	1,687	9,994	11,681	250	283	533	1,210	11,946	13,156
Ghanaian	468	739	1,207	1,687	9,975	11,662	248	280	528	1,203	11,923	13,126
Non-Ghanaian	1	4	5	0	19	19	2	3	5	7	23	30
% Ghanaian	99.8	99.5	99.6	100.0	99.8	99.8	99.2	98.9	99.1	99.4	99.8	99.8
% non-Ghanaian	0.2	0.5	0.4	0.0	0.2	0.2	0.8	1.1	0.9	0.6	0.2	0.2
Non-Ghanaian	1	4	5	0	19	19	2	3	5	7	23	30
Burkinabe	0.0	0.0	0.0	0.0	15.8	15.8	0.0	0.0	0.0	0.0	0.0	0.0
Ivoirian	0.0	50.0	40.0	0.0	15.8	15.8	0.0	0.0	0.0	14.3	4.3	6.7
Nigerian	100.0	50.0	60.0	0.0	10.5	10.5	0.0	0.0	0.0	0.0	26.1	20.0
Togolese	0.0	0.0	0.0	0.0	47.4	47.4	50.0	100.0	80.0	0.0	8.7	6.7
Other African	0.0	0.0	0.0	0.0	10.5	10.5	50.0	0.0	20.0	85.7	60.9	66.7
Non-African	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3.6.7 Disability status of holders

Types of disability of holders

The proportion of holders with some form of disability is highest (1.6%) among those engaged in bee-keeping and higher among holders in the urban (2.4%) than in rural (1.3%) areas. There is no difference in the proportion of holders with some form of disability engaged in tree cropping and aquaculture between the urban and rural areas.

Holders engaged in arable cropping, livestock rearing and capture fisheries with some form of disability are in higher proportions in rural areas than in urban areas (Table 3.51) for males as for females.

Table 3.51: Agricultural holders 15 years or older by disability status and sex, and by type of agricultural activity and type of locality

Disability status	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total	376,374	1,360,066	1,736,440	178,142	587,743	765,885	75,632	247,993	323,625
Without Disability	99.2	98.9	98.9	98.8	98.8	98.8	99	98.6	98.7
With Disability	0.8	1.1	1.1	1.2	1.2	1.2	1.0	1.4	1.3
Male									
Total	267,598	976,236	1,243,834	127,044	444,697	571,741	57,817	206,974	264,791
Without Disability	99.3	99	99	98.9	98.9	98.9	99.1	98.7	98.8
With Disability	0.7	1.0	1.0	1.1	1.1	1.1	0.9	1.3	1.2
Female									
Total	108,776	383,830	492,606	51,098	143,046	194,144	17,815	41,019	58,834
Without Disability	98.9	98.6	98.7	98.4	98.5	98.5	98.6	98.1	98.3
With Disability	1.1	1.4	1.3	1.6	1.5	1.5	1.4	1.9	1.7

Table 3.51: Agricultural holders 15 years or older by disability status and sex, and by type of agricultural activity and type of locality (cont'd)

Disability status	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes												
Total	469	743	1,212	1,687	9,994	11,681	250	823	1,073	1,210	11,946	13,156
Without Disability	98.9	98.9	98.9	98.4	98.6	98.6	97.6	98.7	98.4	99.3	99.1	99.1
With Disability	1.1	1.1	1.1	1.6	1.4	1.4	2.4	1.3	1.6	0.7	0.9	0.9
Male												
Total	433	716	1,149	1,402	8,446	9,848	235	770	1,005	1,175	11,766	12,941
Without Disability	98.8	99	99	98.5	98.7	98.7	97.4	98.7	98.4	99.3	99.1	99.1
With Disability	1.2	1.0	1.0	1.5	1.3	1.3	2.6	1.3	1.6	0.7	0.9	0.9
Female												
Total	36	27	63	285	1,548	1,833	15	53	68	35	180	215
Without Disability	100	96.3	98.4	97.9	98.3	98.2	100	98.1	98.5	100	97.8	98.1
With Disability	0.0	3.7	1.6	2.1	1.7	1.8	0.0	1.9	1.5	0.0	2.2	1.9

Types of disability of holders

In all the agricultural activities, the physically challenged constitute the highest form of disability, followed by those with difficulty in seeing. Capture fisheries holders (38.1%) have the least proportion of physically challenged persons and bee-keeping holders have the highest (58.4%). The responses of female holders engaged in aquaculture, forest trees, bee-keeping and capture fisheries with some form of disability are low compared to males. However, the proportion of female engaged in arable crops, tree crops and livestock who are physically challenged are higher than their male counterparts. (Table 3.52)

Table 3.52: Agricultural holders 15 years or older by type of disability and sex, and by type of agricultural activity and type of locality

Type of disability	Arable crops			Tree crops			Livestock		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total responses*	5420	22613	28022	3284	9796	13080	1056	4507	5570
Sight	27.3	27.6	27.5	26.8	29.6	28.9	29.0	28.1	28.3
Hearing	18.3	17.2	17.4	15.3	15.3	15.3	15.3	14.3	14.5
Speech	15.6	13.8	14.1	12.5	13.0	12.9	11.5	9.5	9.9
Physical	38.8	41.4	41.0	45.4	42.1	42.9	44.2	48.1	47.3
Male									
Total responses	3523	15079	18592	2142	6875	9010	715	3589	4310
Sight	27.4	28.1	28.0	27.3	29.7	29.1	29.0	27.9	28.1
Hearing	18.6	17.4	17.6	16.1	15.3	15.5	15.4	14.7	14.8
Speech	16.5	14.5	14.9	14.2	13.6	13.8	11.6	10.4	10.6
Physical	37.5	40.0	39.5	42.4	41.4	41.6	44.0	47.0	46.5
Female									
Total responses	1897	7534	9430	1142	2921	4065	341	918	1260
Sight	27.1	26.5	26.7	25.9	29.3	28.4	29.0	28.9	28.9
Hearing	17.7	16.7	16.9	13.7	15.3	14.9	15.2	12.6	13.4
Speech	13.8	12.3	12.6	9.4	11.5	10.9	11.1	6.0	7.4
Physical	41.4	44.5	43.8	51.0	43.9	45.8	44.7	52.5	50.3

*A person could have more than one form of disability.

Table 3.52: Agricultural holders 15 years or older by type of disability and sex, and by type of agricultural activity and type of locality (cont'd)

Type of disability	Aquaculture			Forest trees			Bee-keeping			Capture fisheries		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes												
Total responses*	9	12	21	41	155	196	12	12	24	8	139	147
Sight	22.2	25.0	23.8	26.8	41.9	38.8	33.3	8.3	20.8	50.0	35.3	36.1
Hearing	11.1	8.3	9.5	17.1	4.5	7.1	16.7	8.3	12.5	12.5	15.8	15.6
Speech	22.2	8.3	14.3	12.2	7.1	8.2	16.7	0.0	8.3	0.0	10.8	10.2
Physical	44.5	58.4	52.4	43.9	46.5	45.9	33.3	83.4	58.4	37.5	38.1	38.1
Male												
Total responses	9	10	19	34	120	154	12	11	23	8	132	140
Sight	22.2	20.0	21.1	26.5	39.2	36.4	33.3	9.1	21.7	50.0	36.4	37.1
Hearing	11.1	10.0	10.5	14.7	3.3	5.8	16.7	9.1	13.0	12.5	15.2	15.0
Speech	22.2	10.0	15.8	14.7	7.5	9.1	16.7	0.0	8.7	0.0	10.6	10.0
Physical	44.5	60.0	52.6	44.1	50.0	48.7	33.3	81.8	56.6	37.5	37.8	37.9
Female												
Total responses	0	2	2	7	35	42	0	1	1	0	7	7
Sight	0.0	50.0	50.0	28.6	51.4	47.6	0.0	0.0	0.0	0.0	14.3	14.3
Hearing	0.0	0.0	0.0	28.6	8.6	11.9	0.0	0.0	0.0	0.0	28.6	28.6
Speech	0.0	0.0	0.0	0.0	5.7	4.8	0.0	0.0	0.0	0.0	14.3	14.3
Physical	0.0	50.0	50.0	42.8	34.3	35.7	0.0	100.0	100.0	0.0	42.8	42.8

*A person could have more than one form of disability.

CHAPTER FOUR

LAND USE

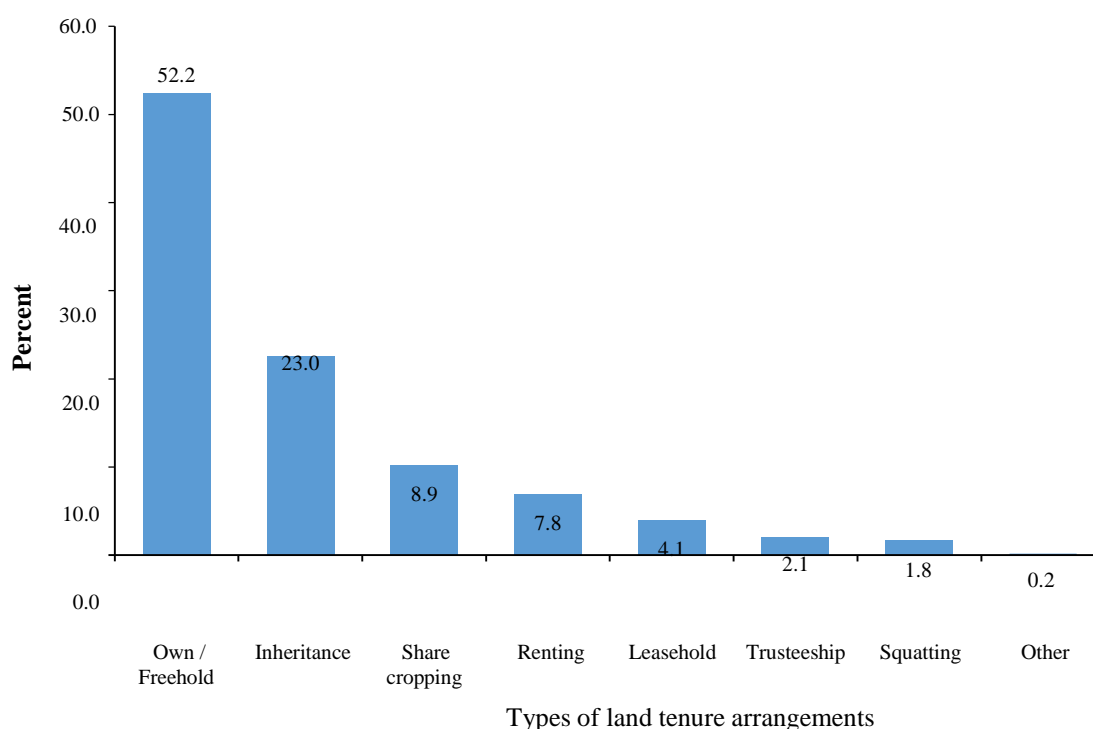
4.1 Introduction

This chapter presents land tenure arrangements, legal status and size of parcels of land used by persons engaged in agriculture as disaggregated by sex and type of locality of holders.

4.2 Land tenure arrangements

About three-quarters (75.2%) of parcels used by holders for the production of crops in the 2017/18 cropping season are owned (52.2%) or inherited (23.0%). Land used for share-cropping constitutes 8.9 percent whereas parcels held in trust (2.1%) and squatting (1.8%) are not very common types of tenure arrangements (Figure 4.1).

Figure 4.1: Type of land tenure arrangements of agricultural holders 15 years or older (percent)



The total number of parcels used for the production of arable crops, tree crops and forest trees is 3,130,492. More than eight in every ten parcels (84.0%) are used either partially or solely in the cultivation of arable crops, 40.9 percent for tree crops and 1.0 percent⁹. This general pattern is reflected in all the land tenure arrangements, except for parcels used for share-cropping. Share-cropping is the most common land tenure arrangement used for the cultivation of tree crops (70.0%) and the least for the cultivation of arable crops even at 75.1 percent. Cultivators of arable crops use all types of land tenure arrangements systems intensively with renting and squatting being close to 100 percent. The use of share-cropping system of land tenure arrangement is the dominant choice for the cultivation of tree crops at 70 percent with the other

⁹ Parcel may be used for more one type agricultural activity (mixed cropping)

forms well below 50 percent. Similar patterns are observed in the land tenure arrangement for the urban and rural areas (Table 4.1).

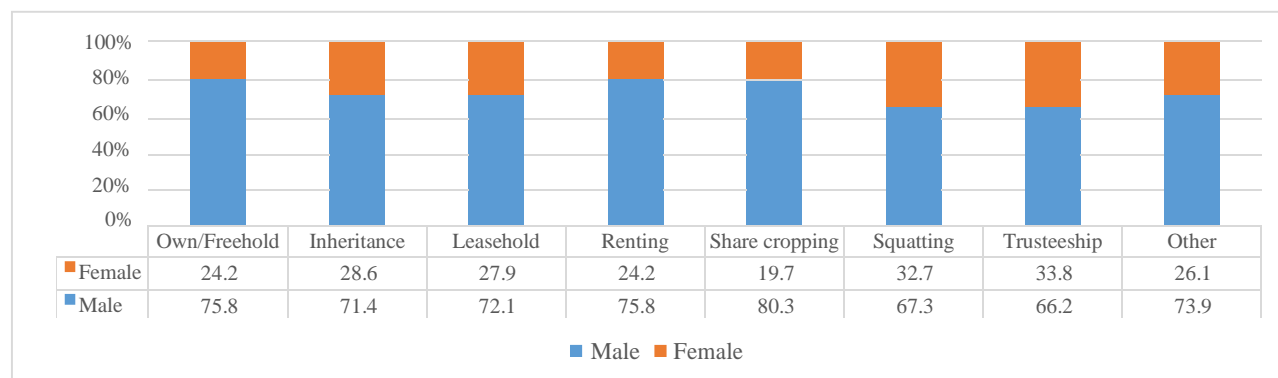
Table 4.1: Land parcels for agriculture by type of tenure arrangement and type of locality, and by type of agricultural activity*

Type of land	Arable crops		Tree crops		Forest tree		
tenure	Number	%	Number	%	Number	%	Total
Total	2,628,869	84.0	1,278,978	40.9	27,139	1.0	3,130,492
Own/Freehold	1,320,667	80.8	729,545	44.6	15,152	1.1	1,635,314
Inheritance	632,228	87.7	252,259	35.0	5,941	0.9	720,535
Leasehold	111,922	87.6	42,965	33.6	1,016	0.9	127,705
Renting	236,080	97.2	32,889	13.5	1,672	0.7	242,889
Share-cropping	208,793	75.1	194,744	70.0	2,434	1.2	278,167
Squatting	54,288	97.7	7,136	12.8	377	0.7	55,572
Trusteeship	59,975	92.3	17,952	27.6	472	0.8	64,986
Other	4,916	92.3	1,488	27.9	75	1.5	5,324
Urban							
Total	545,328	81.8	290,857	43.6	3,702	0.7	666,552
Own/Freehold	262,564	77.8	164,223	48.7	1,976	0.8	337,297
Inheritance	114,788	81.8	66,295	47.3	925	0.8	140,263
Leasehold	26,112	87.6	8,787	29.5	167	0.6	29,801
Renting	67,942	96.7	9,307	13.2	149	0.2	70,281
Share-cropping	37,976	74.3	34,744	68.0	257	0.7	51,115
Squatting	15,811	98.0	1,906	11.8	91	0.6	16,138
Trusteeship	18,390	92.8	5,249	26.5	123	0.7	19,823
Other	1,745	95.1	346	18.9	14	0.8	1,834
Rural							
Total	2,083,541	84.6	988,121	40.1	23,437	1.1	2,463,940
Own/Freehold	1,058,103	81.5	565,322	43.6	13,176	1.2	1,298,017
Inheritance	517,440	89.2	185,964	32.0	5,016	1.0	580,272
Leasehold	85,810	87.6	34,178	34.9	849	1.0	97,904
Renting	168,138	97.4	23,582	13.7	1,523	0.9	172,608
Share-cropping	170,817	75.2	160,000	70.5	2,177	1.3	227,052
Squatting	38,477	97.6	5,230	13.3	286	0.7	39,434
Trusteeship	41,585	92.1	12,703	28.1	349	0.8	45,163
Other	3,171	90.9	1,142	32.7	61	1.9	3,490

* One parcel may be used for multiple activities and therefore the row percentages do not add up to 100 percent.

In all the types of land tenure arrangements, the proportion of the parcels used for the cultivation of crops (arable crops, tree crops and forest trees) by female holders constitute less than a quarter (24.2%), except for trusteeship and squatting where the proportion of parcel used by female holders are about one-third (33.8% and 32.7% respectively), see Figure 4.2.

Figure 4.2: Type of land tenure arrangements of agricultural holders 15 years or older by sex (percent)



Freehold and inheritance are the dominant land tenure arrangements. For all three types of crops, holders who use freehold or inheritance constitute about three-quarters. More than half of the holders engaged in arable crops (50.2%), forest trees (55.8%) and tree crops (57.0%) own their parcels through freehold. The proportion of holders who acquired their parcels through inheritance is the second highest for holders cultivating arable crops (24.0%), forest tree (21.9%) and tree crops (19.7%). The proportion of female holders engaged in tree cropping (59.8%) who own their parcels of land is higher than that of male holders (56.2%), see Table 4.2.

Table 4.2: Land parcels for agriculture by type of tenure arrangement, and by type of agricultural activity and sex of holder

Type of land tenure	Arable crops			Tree crops			Forest trees		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	1,961,113	667,756	2,628,869	974,742	304,236	1,278,978	23,351	3,788	27,139
Own/Freehold	51.3	47.2	50.2	56.2	59.8	57.0	56.4	52.2	55.8
Inheritance	23.1	26.8	24.0	18.3	24.2	19.7	21.4	24.9	21.9
Leasehold	4.0	4.9	4.3	3.6	2.7	3.4	3.7	3.8	3.7
Renting	9.1	8.6	9.0	2.9	1.6	2.6	5.8	8.6	6.2
Share-cropping	8.4	6.5	7.9	17.0	9.6	15.2	9.5	5.6	9.0
Squatting	1.9	2.7	2.1	0.6	0.6	0.6	1.2	2.4	1.4
Trusteeship	2.0	3.1	2.3	1.4	1.5	1.4	1.7	1.8	1.7
Other	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.7	0.3

4.3 Legal status of agricultural lands

Generally, majority (82.6%) of the parcels used by holders is not covered by any form of documentation on the tenure arrangement. Only about 13 percent of the parcels have complete documents, with 3.2 percent having partial documentations. The proportions of parcels under freehold (16.0%), share-cropping (15.7%) and leasehold (13.4%) land tenure arrangements covered by documents are relatively higher compared to the other categories of tenure arrangements. Three-quarters (74.7%) of the total number of parcels of land (3,130,492) are used by male holders. The proportion of parcels with documents used by males under leasehold (14.7%) and share-cropping (16.3%) is substantially higher than for females (leasehold is 4.5% and share-cropping is 2.9%). The proportion of documented parcels used by male and female holders under freehold and inheritance are almost the same (Table 4.3).

Table 4.3: Land parcels for agriculture by type of tenure arrangement and sex of holder, and by status of documentation

Type of land tenure	Status of documentation			No documentation	Number of parcels
	Complete	Partial	Now processing		
Both Sexes	12.9	3.2	1.3	82.6	3,130,492
Own/Freehold	16.0	2.7	1.2	80.1	1,635,314
Inheritance	7.7	2.3	1.0	89.0	720,535
Leasehold	13.4	9.0	2.2	75.4	127,705
Renting	8.6	4.7	1.1	85.6	242,889
Share-cropping	15.7	5.9	3.6	74.8	278,167
Squatting	0.0	0.0	0.0	100.0	55,572
Trusteeship	6.9	2.2	0.6	90.3	64,986
Other	9.9	3.3	0.6	86.2	5,324
Male					
Total	13.1	3.3	1.4	82.2	2,337,762
Own/Freehold	16.0	2.6	1.2	80.2	1,239,145
Inheritance	7.6	2.2	1.0	89.2	514,581
Leasehold	14.7	9.6	2.4	73.3	92,062
Renting	9.0	4.9	1.1	85.0	184,183
Share-cropping	16.3	6.2	3.8	73.7	223,482
Squatting	0.0	0.0	0.0	100.0	37,378
Trusteeship	7.6	2.5	0.7	89.2	42,995
Other	10.4	3.7	0.5	85.4	3,936
Female					
Total	12.2	3.1	1.2	83.5	792,730
Own/Freehold	16.3	2.8	1.1	79.8	396,169
Inheritance	7.7	2.5	0.9	88.9	205,954
Leasehold	10.2	7.3	1.7	80.8	35,643
Renting	7.4	4.3	1.1	87.2	58,706
Share-cropping	13.4	4.9	2.8	78.9	54,685
Squatting	0.0	0.0	0.0	100.0	18,194
Trusteeship	5.5	1.9	0.5	92.1	21,991
Other	8.5	2.2	0.9	88.4	1,388

Seven in ten of parcels used for tree crop and forest tree farming have no documentation and eight in ten parcels for arable crop farming are also not covered by any documentation. Only about a tenth of parcels used for arable crops have full documentation while 2.9 percent of parcels for arable crops have partially completed documentation. For the cultivation of tree crops and forest trees, about one-fifth of parcels have documents (Table 4.4).

Table 4.4: Land parcels for agriculture by type of tenure arrangement and type of agricultural activity, and by status of documentation

Type of land tenure/Type of activity	Status of documentation			No documentation	Number of parcels
	Complete	Partial	Now processing		
Arable crop farming					
Total	10.6	2.9	1.1	85.5	2,628,869
Own/Freehold	13.2	2.3	0.9	83.6	1,320,667
Inheritance	6.3	1.9	0.8	91.0	632,228
Leasehold	11.2	8.3	1.7	78.8	111,922
Renting	8.1	4.6	1.1	86.2	236,080
Share-cropping	13.6	5.4	3.3	77.7	208,793
Squatting	0.0	0.0	0.0	100.0	54,288
Trusteeship	5.9	2.0	0.5	91.6	59,975
Other	7.1	2.4	0.4	90.1	4,916
Tree crop farming					
Total	21.2	4.6	2.3	71.9	1,278,978
Own/Freehold	24.6	3.9	2.0	69.5	729,545
Inheritance	14.3	3.8	1.6	80.3	252,259
Leasehold	25.6	11.6	4.2	58.6	42,965
Renting	14.3	5.8	2.0	77.9	32,889
Share-cropping	19.2	6.8	4.2	69.7	194,744
Squatting	0.0	0.0	0.0	100.0	7,136
Trusteeship	11.9	3.3	1.1	83.7	17,952
Other	22.3	8.2	0.9	68.5	1,488
Forest tree farming					
Total	20.3	5.5	1.6	72.6	27,139
Own/Freehold	25.2	5.4	1.5	67.9	15,152
Inheritance	11.8	4.2	1.3	82.6	5,941
Leasehold	27.2	10.8	2.7	59.4	1,016
Renting	6.9	9.0	0.7	83.4	1,672
Share-cropping	21.6	6.3	3.5	68.7	2,434
Squatting	0.0	0.0	0.0	100.0	377
Trusteeship	12.9	1.7	0.4	85.0	472
Other	12.0	0.0	0.0	88.0	75

4.4 Size of parcels

Majority of parcels of land (56.7%) under cultivation are small-scale, one-quarter (25.6%) are medium-scale, while 17.7 percent are large-scale. A higher proportion of females (71.4%) than males (51.7%) engage in small-scale farming in both urban and rural areas (Table 4.5).

Table 4.5: Land parcels for agriculture by size of parcel and sex of holder, and by type of locality

Land size	Number of parcels			Percentage of parcels		
	Urban	Rural	Total	Urban	Rural	Total
Both sexes						
Total	666,552	2,463,940	3,130,492	100.0	100.0	100.0
Small-scale (< 2 acres)	377,666	1,397,795	1,775,461	56.7	56.7	56.7
Medium-scale (2-5 acres)	170,096	631,665	801,761	25.5	25.6	25.6
Large-scale (> 5 acres)	118,790	434,480	553,270	17.8	17.6	17.7
Male						
Total	486,323	1,851,439	2,337,762	100.0	100.0	100.0
Small-scale (< 2 acres)	255,389	953,731	1,209,120	52.5	51.5	51.7
Medium-scale (2-5 acres)	131,595	512,672	644,267	27.1	27.7	27.6
Large-scale (> 5 acres)	99,339	385,036	484,375	20.4	20.8	20.7
Female						
Total	180,229	612,501	792,730	100.0	100.0	100.0
Small-scale (< 2 acres)	122,277	444,064	566,341	67.8	72.5	71.4
Medium-scale (2-5 acres)	38,501	118,993	157,494	21.4	19.4	19.9
Large-scale (> 5 acres)	19,451	49,444	68,895	10.8	8.1	8.7

Most of the parcels used for all three types of crops (arable crops, 59.4%; tree crops, 49.1%; and forest trees, 53.1%) are small-scale (56.7%) with medium-scale parcels constituting a quarter (25.6%) and large-scale (17.7%) being the remainder of parcels. A similar pattern is observed for both sex of holder and type of locality, with the exception of forest tree cultivation in the urban areas where large-scale farming is second to small-scale (Table 4.6).

Table 4.6: Land parcels for agriculture by size of parcel and sex of holder, and by type of agricultural activity and type of locality

Land size	Arable crops			Tree crops			Forest trees		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Both sexes									
Total	545,328	2,083,541	2,628,869	290,857	988,121	1,278,978	3,702	23,437	27,139
Small-scale (< 2 acres)	60.5	59.1	59.4	47.8	49.4	49.1	43.9	54.6	53.1
Medium-scale (2-5 acres)	24.2	24.6	24.5	28.2	28.3	28.3	27.1	24.3	24.7
Large-scale (> 5 acres)	15.3	16.2	16.0	24.0	22.2	22.6	29.0	21.2	22.2
Male									
Total	399,080	1,562,033	1,961,113	211,612	763,130	974,742	3,160	20,191	23,351
Small-scale (< 2 acres)	56.0	53.5	54.0	45.2	46.8	46.5	41.9	52.4	51.0
Medium-scale (2-5 acres)	26.1	27.0	26.8	28.4	28.6	28.6	27.6	24.8	25.2
Large-scale (> 5 acres)	17.9	19.5	19.2	26.4	24.6	25.0	30.5	22.8	23.8
Female									
Total	146,248	521,508	667,756	79,245	224,991	304,236	542	3,246	3,788
Small-scale (< 2 acres)	72.9	75.9	75.3	54.6	58.3	57.3	55.4	67.8	66.0
Medium-scale (2-5 acres)	18.9	17.5	17.8	27.8	27.3	27.5	24.5	21.0	21.5
Large-scale (> 5 acres)	8.2	6.5	6.9	17.5	14.4	15.2	20.1	11.2	12.4

CHAPTER FIVE

OWNERSHIP AND USE OF AGRICULTURAL EQUIPMENT

5.1 Introduction

This chapter provides information on the ownership and use of agricultural equipment and machinery required to perform various activities, such as land preparation, weeding, harvesting, pest control, irrigation and drainage, transportation, livestock processing, crop processing and storage. The chapter considers equipment as animal traction, tractor, power tiller, shellers, knapsack sprayer and mist blower which are employed in arable cropping, tree cropping, forest tree cultivation and livestock rearing.

5.2 Ownership and use of agricultural equipment

Knapsack sprayer (31.7%) is the most commonly owned agricultural equipment by holders. Only 3.4 percent of holders own mist blower and the proportion of holders who own the other equipment is less than 1 percent. Most holders use agricultural equipment that they do not own. Majority of holders use knapsack (73.0%). Other equipment mostly used by holders include tractor (24.7%) and mist blower (22.0%). About 10 times as many use as own animal traction. Substantially, a high number of holders use tractors (534,190) compared to the number of holders who own tractors (7,454).

Generally, higher proportions of males than females own and use agricultural equipment. The proportion of male holders who own knapsack is more than twice as high (38.1%) as females (15.2%). The proportions of male holders who use tractor, knapsack and mist blower are higher than their female counterparts by 11.1, 5.5 and 3.3 percentage points respectively. This general pattern is also observed in both urban and rural areas (Table 5.1).

Table 5.1: Agricultural holders 15 years or older by agricultural equipment and sex of holder and by ownership, use and type of locality

Equipment	Own						Use					
	Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Both sexes	502,098		1,656,599		2,158,697		502,098		1,656,599		2,158,697	
Animal traction	1,877	0.4	17,976	1.1	19,853	0.9	21,832	4.3	169,000	10.2	190,832	8.8
Tractor	2,386	0.5	5,068	0.3	7,454	0.3	108,979	21.7	425,211	25.7	534,190	24.7
Power tiller	569	0.1	2,045	0.1	2,614	0.1	6,078	1.2	16,108	1.0	22,186	1.0
Shellers	1,826	0.4	4,031	0.2	5,857	0.3	57,533	11.5	142,862	8.6	200,395	9.3
Knapsack sprayer	152,517	30.4	531,334	32.1	683,851	31.7	348,887	69.5	1,227,947	74.1	1,576,834	73.0
Mist blower	14,820	3.0	59,571	3.6	74,391	3.4	95,418	19.0	379,127	22.9	474,545	22.0
Hatchery/ incubator	383	0.1	1,011	0.1	1,394	0.1	1,446	0.3	4,332	0.3	5,778	0.3
Milking equipment	792	0.2	2,683	0.2	3,475	0.2	1,353	0.3	4,723	0.3	6,076	0.3
Meat processing	1,759	0.4	5,910	0.4	7,669	0.4	2,871	0.6	8,618	0.5	11,489	0.5
Poultry processing equip.	497	0.1	932	0.1	1,429	0.1	1,741	0.3	4,052	0.2	5,793	0.3
Male	356,383		1,194,882		1,551,265		356,383		1,194,882		1,551,265	
Animal traction	1,736	0.5	16,541	1.4	18,277	1.2	17,185	4.8	121,018	10.1	138,203	8.9
Tractor	2,176	0.6	4,574	0.4	6,750	0.4	91,504	25.7	340,547	28.5	432,051	27.9
Power tiller	464	0.1	1,593	0.1	2,057	0.1	5,035	1.4	13,202	1.1	18,237	1.2
Shellers	1,570	0.4	3,300	0.3	4,870	0.3	48,517	13.6	124,232	10.4	172,749	11.1
Knapsack sprayer	127,570	35.8	463,730	38.8	591,300	38.1	253,516	71.1	903,814	75.6	1,157,330	74.6
Mist blower	12,242	3.4	53,613	4.5	65,855	4.2	68,404	19.2	286,852	24.0	355,256	22.9
Hatchery/incubator	318	0.1	834	0.1	1,152	0.1	1,126	0.3	3,380	0.3	4,506	0.3
Milking equipment	614	0.2	2,054	0.2	2,668	0.2	1,041	0.3	3,530	0.3	4,571	0.3
Meat processing	1,263	0.4	4,371	0.4	5,634	0.4	2,127	0.6	6,424	0.5	8,551	0.6
Poultry processing equip.	387	0.1	730	0.1	1,117	0.1	1,340	0.4	3,104	0.3	4,444	0.3
Female	145,715		461,717		607,432		145,715		461,717		607,432	
Animal traction	141	0.1	1,435	0.3	1,576	0.3	4,647	3.2	47,982	10.4	52,629	8.7
Tractor	210	0.1	494	0.1	704	0.1	17,475	12.0	84,664	18.3	102,139	16.8
Power tiller	105	0.1	452	0.1	557	0.1	1,043	0.7	2,906	0.6	3,949	0.7
Shellers	256	0.2	731	0.2	987	0.2	9,016	6.2	18,630	4.0	27,646	4.6
Knapsack sprayer	24,947	17.1	67,604	14.6	92,551	15.2	95,371	65.5	324,133	70.2	419,504	69.1
Mist blower	2,578	1.8	5,958	1.3	8,536	1.4	27,014	18.5	92,275	20.0	119,289	19.6
Hatchery/incubator	65	0.0	177	0.0	242	0.0	320	0.2	952	0.2	1,272	0.2
Milking equipment	178	0.1	629	0.1	807	0.1	312	0.2	1,193	0.3	1,505	0.2
Meat processing	496	0.3	1,539	0.3	2,035	0.3	744	0.5	2,194	0.5	2,938	0.5
Poultry processing equip.	110	0.1	202	0.0	312	0.1	401	0.3	948	0.2	1,349	0.2

About 47 percent of forest tree, 40.3 percent of tree crop and 31.5 percent of arable crop holders own the knapsack sprayer. The corresponding proportions of holders who use the knapsack sprayer on their farms are much higher. Regardless of the type of crop grown, more male than female holders own agricultural equipment. Generally, the use of knapsack and mist blower is common among arable, tree and forest crop holders. A relatively high proportion of arable crop holders also use tractor (30.5%), shellers (11.3%) and animal traction (10.9%) on their farms. Regardless of sex of holder, there are no marked differences between ownership and use of agricultural equipment in both urban and rural areas (Table 5.2 and Table 5.3).

Table 5.2: Agricultural holders 15 years or older who own agricultural equipment by type of agricultural equipment and sex of holder, and by type of agricultural activity and type of locality

Equipment	Arable crop						Tree crop						Forest Tree					
	Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Both sexes	376,374		1,360,066		1,736,440		178,142		587,743		765,885		1,687		9,994		11,681	
Animal traction	1,734	0.5	17,573	1.3	19,307	1.1	133	0.1	631	0.1	764	0.1	4	0.2	105	1.1	109	0.9
Tractor	2,170	0.6	4,734	0.3	6,904	0.4	358	0.2	699	0.1	1,057	0.1	18	1.1	28	0.3	46	0.4
Power tiller	466	0.1	1,881	0.1	2,347	0.1	140	0.1	344	0.1	484	0.1	1	0.1	9	0.1	10	0.1
Shellers	1,464	0.4	2,903	0.2	4,367	0.3	491	0.3	1,655	0.3	2,146	0.3	8	0.5	15	0.2	23	0.2
Knapsack sprayer	117,254	31.2	429,608	31.6	546,862	31.5	69,269	38.9	239,003	40.7	308,272	40.3	818	48.5	4,692	46.9	5,510	47.2
Mist blower	6,563	1.7	30,154	2.2	36,717	2.1	13,516	7.6	56,528	9.6	70,044	9.1	164	9.7	1,530	15.3	1,694	14.5
Male	267,598		976,236		1,243,834		127,044		444,697		571,741		1,402		8,446		9,848	
Animal traction	1,619	0.6	16,234	1.7	17,853	1.4	104	0.1	536	0.1	640	0.1	4	0.3	104	1.2	108	1.1
Tractor	1,986	0.7	4,299	0.4	6,285	0.5	313	0.2	574	0.1	887	0.2	18	1.3	28	0.3	46	0.5
Power tiller	381	0.1	1,467	0.2	1,848	0.1	111	0.1	281	0.1	392	0.1	1	0.1	8	0.1	9	0.1
Shellers	1,305	0.5	2,585	0.3	3,890	0.3	374	0.3	1,180	0.3	1,554	0.3	8	0.6	15	0.2	23	0.2
Knapsack sprayer	99,297	37.1	377,087	38.6	476,384	38.3	56,861	44.8	206,959	46.5	263,820	46.1	735	52.4	4,357	51.6	5,092	51.7
Mist blower	5,644	2.1	27,381	2.8	33,025	2.7	11,250	8.9	51,220	11.5	62,470	10.9	153	10.9	1,465	17.3	1,618	16.4
Female	108,776		383,830		492,606		51,098		143,046		194,144		285		1,548		1,833	
Animal traction	115	0.1	1,339	0.3	1,454	0.3	29	0.1	95	0.1	124	0.1	0	0.0	1	0.1	1	0.1
Tractor	184	0.2	435	0.1	619	0.1	45	0.1	125	0.1	170	0.1	0	0.0	0	0.0	0	0.0
Power tiller	85	0.1	414	0.1	499	0.1	29	0.1	63	0.0	92	0.0	0	0.0	1	0.1	1	0.1
Shellers	159	0.1	318	0.1	477	0.1	117	0.2	475	0.3	592	0.3	0	0.0	0	0.0	0	0.0
Knapsack sprayer	17,957	16.5	52,521	13.7	70,478	14.3	12,408	24.3	32,044	22.4	44,452	22.9	83	29.1	335	21.6	418	22.8
Mist blower	919	0.8	2,773	0.7	3,692	0.7	2,266	4.4	5,308	3.7	7,574	3.9	11	3.9	65	4.2	76	4.1

Table 5.3: Agricultural holders 15 years or older who use agricultural equipment by type of agricultural equipment and sex of holder, and by agricultural activity and type of locality

Equipment	Arable crop						Tree crop						Forest Tree					
	Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
All holders	376,374		1,360,066		1,736,440		178,142		587,743		765,885		1,687		9,994		11,681	
Animal traction	21,242	5.6	167,859	12.3	189,101	10.9	473	0.3	2,030	0.3	2,503	0.3	10	0.6	274	2.7	284	2.4
Tractor	106,449	28.3	422,672	31.1	529,121	30.5	6,918	3.9	14,175	2.4	21,093	2.8	185	11.0	473	4.7	658	5.6
Power tiller	5,420	1.4	15,494	1.1	20,914	1.2	950	0.5	1,548	0.3	2,498	0.3	27	1.6	31	0.3	58	0.5
Shellers	56,217	14.9	139,873	10.3	196,090	11.3	6,437	3.6	14,754	2.5	21,191	2.8	121	7.2	204	2.0	325	2.8
Knapsack sprayer	278,444	74.0	1,009,877	74.3	1,288,321	74.2	138,708	77.9	475,756	80.9	614,464	80.2	1,162	68.9	6,688	66.9	7,850	67.2
Mist blower	49,907	13.3	202,224	14.9	252,131	14.5	86,994	48.8	355,720	60.5	442,714	57.8	509	30.2	4,538	45.4	5,047	43.2
Male	267,598		976,236		1,243,834		127,044		444,697		571,741		1,402		8,446		9,848	
Animal traction	16,710	6.2	120,129	12.3	136,839	11.0	365	0.3	1,700	0.4	2,065	0.4	6	0.4	264	3.1	270	2.7
Tractor	89,482	33.4	338,512	34.7	427,994	34.4	5,635	4.4	12,313	2.8	17,948	3.1	173	12.3	451	5.3	624	6.3
Power tiller	4,494	1.7	12,713	1.3	17,207	1.4	751	0.6	1,301	0.3	2,052	0.4	24	1.7	30	0.4	54	0.5
Shellers	47,518	17.8	122,086	12.5	169,604	13.6	5,131	4.0	12,181	2.7	17,312	3.0	110	7.8	194	2.3	304	3.1
Knapsack sprayer	202,820	75.8	740,412	75.8	943,232	75.8	99,594	78.4	361,948	81.4	461,542	80.7	994	70.9	5,854	69.3	6,848	69.5
Mist blower	35,786	13.4	153,025	15.7	188,811	15.2	62,563	49.2	271,603	61.1	334,166	58.4	442	31.5	3,993	47.3	4,435	45.0
Female	108,776		383,830		492,606		51,098		143,046		194,144		285		1,548		1,833	
Animal traction	4,532	4.2	47,730	12.4	52,262	10.6	108	0.2	330	0.2	438	0.2	4	1.4	10	0.6	14	0.8
Tractor	16,967	15.6	84,160	21.9	101,127	20.5	1,283	2.5	1,862	1.3	3,145	1.6	12	4.2	22	1.4	34	1.9
Power tiller	926	0.9	2,781	0.7	3,707	0.8	199	0.4	247	0.2	446	0.2	3	1.1	1	0.1	4	0.2
Shellers	8,699	8.0	17,787	4.6	26,486	5.4	1,306	2.6	2,573	1.8	3,879	2.0	11	3.9	10	0.6	21	1.1
Knapsack sprayer	75,624	69.5	269,465	70.2	345,089	70.1	39,114	76.5	113,808	79.6	152,922	78.8	168	58.9	834	53.9	1,002	54.7
Mist blower	14,121	13.0	49,199	12.8	63,320	12.9	24,431	47.8	84,117	58.8	108,548	55.9	67	23.5	545	35.2	612	33.4

5.3 Ownership and use of agricultural equipment for livestock

Equipment is hardly used by livestock holders. Of the four main equipment associated with livestock rearing, meat processing equipment is found to be the mostly owned or used by holders. Only 1.3 percent of livestock holders use meat processing and less than 1 percent of the holders use other livestock equipment. Relatively higher proportions of holders in urban areas compared to those in rural areas use livestock equipment. Ownership of equipment follows a similar pattern (Table 5.4). More male livestock holders own or use livestock equipment than their female counterparts.

Table 5.4: Livestock holders 15 years or older by livestock equipment and sex of holder, and by ownership, use and type of locality

Equipment	Own						Use					
	Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Both sexes	75,632		247,993		323,625		75,632		247,993		323,625	
Hatchery/incubator	345	0.5	343	0.1	688	0.2	1,114	1.5	1,665	0.7	2,779	0.9
Milking equipment	339	0.4	643	0.3	982	0.3	780	1.0	1,474	0.6	2,254	0.7
Meat processing	669	0.9	1,411	0.6	2,080	0.6	1,619	2.1	2,646	1.1	4,265	1.3
Poultry processing equipment	408	0.5	370	0.1	778	0.2	1,341	1.8	1,257	0.5	2,598	0.8
Male	57,817		206,974		264,791		57,817		206,974		264,791	
Hatchery/incubator	301	0.5	291	0.1	592	0.2	945	1.6	1,465	0.7	2,410	0.9
Milking equipment	296	0.5	551	0.3	847	0.3	686	1.2	1,268	0.6	1,954	0.7
Meat processing	528	0.9	983	0.5	1,511	0.6	1,291	2.2	1,957	0.9	3,248	1.2
Poultry processing equipment	329	0.6	322	0.2	651	0.2	1,061	1.8	1,044	0.5	2,105	0.8
Female	17,815		41,019		58,834		17,815		41,019		58,834	
Hatchery/incubator	44	0.2	52	0.1	96	0.2	169	0.9	200	0.5	369	0.6
Milking equipment	43	0.2	92	0.2	135	0.2	94	0.5	206	0.5	300	0.5
Meat processing	141	0.8	428	1.0	569	1.0	328	1.8	689	1.7	1,017	1.7
Poultry processing equipment	79	0.4	48	0.1	127	0.2	280	1.6	213	0.5	493	0.8

CHAPTER SIX

AQUACULTURE

6.1 Introduction

This chapter presents information on characteristics of holders in aquaculture, the type of production facility (ponds, cages, dams/dugout, reservoir and tanks), the system of production (monoculture, poly-culture and integrated) and the type of establishment (hatchery and grow-out) used in aquaculture. The chapter also discusses species cultured, types of equipment and implements used, quantity produced, quantity sold and cost of production.

6.2 Age of holders

6.2.1 Age of holders and production facility

Ponds are the major production facility as 1,176 out of a total of 1,386 aquaculture holders use pond in the production of fish. The next commonly used facility is cage which is used by 101 holders to culture fish. Young persons aged 15-24 years are rarely holders of aquaculture. About seven in ten of aquaculture holders are at least 36 -59 years old and the highest proportion of them use tank facilities. For persons aged 25-35 years, the highest proportion of them (25.7%) use the cage facility (Table 6.1).

Table 6.1: Aquaculture holders 15 years or older by age, and by type of production facility

Age (years)*	Facilities					Total	
	Pond	Cage	Dam/ Dug-out	Reservoir	Tank	Number	Percent
Total	1,176	101	51	24	34	1,386	100.0
15-19	0.0	0.0	0.0	0.0	0.0	0	0.0
20-24	1.1	1.0	2.0	0.0	0.0	15	1.1
25-35	15.1	25.7	17.6	12.5	17.6	221	15.9
36-59	68.9	64.4	60.8	66.7	73.5	947	68.3
60+	15.0	8.9	19.6	20.8	8.8	203	14.6

* There was no one under 20 years who was engaged in aquaculture

6.2.2 Age distribution of holders and system of production

Monoculture is the predominant system of production by aquaculture production, with 85.4 percent of 1,386 holders using this system. The integrated system of production is not common. Only 27 out of the 1,386 holders use the integrated system with a higher proportion (81.5%) of them being adults aged 36 years or older (Table 6.2).

Table 6.2: Aquaculture holders 15 years or older by age, and by type of production system

Age	Systems of production						Total	
	Monoculture		Polyculture		Integrated			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,183	100.0	176	100.0	27	100.0	1,386	100.0
15-19	0	0.0	0	0.0	0	0.0	0	0.0
20-24	13	1.1	2	1.1	0	0.0	15	1.1
25-35	196	16.6	20	11.4	5	18.5	221	15.9
36-59	809	68.4	119	67.6	19	70.4	947	68.3
60+	165	13.9	35	19.9	3	11.1	203	14.6

6.2.3 Youth (15-35 years) in aquaculture

The youth population of holders who are into aquaculture is 236. Most holders of aquaculture are persons older than 24 years. About two-thirds of the youth engaged in aquaculture are in the 30-35 years age group while a little over a quarter is in the 25-29 years age group. Ponds and cages are the most common production facilities used by the youth. The proportion of youth among aquaculture holders using cage facility is the highest (26.7%). This is followed by those using dam/dugout (19.6%) and tank (17.6%). Majority of youth holders who are into aquaculture are males. (Table 6.3).

Table 6.3: Aquaculture holders 15-35 years (youth) by age, and by type of production system

Age group	Pond Number	Cage Number	Dam/ Dug-out Number	Reservoir Number	Tank Number	Total Number	Percent
Total	1,176	101	51	24	34	1,386	
Both Sexes	190	27	10	3	6	236	100
15-19	0	0	0	0	0	0	0
20-24	13	1	1	0	0	15	6.4
25-29	46	12	2	1	1	62	26.3
30-35	131	14	7	2	5	159	67.4
Youth							
15-24	13	1	1	0	0	15	6.4
15-35	190	27	10	3	6	236	100
Males	180	27	9	3	5	224	
15-19	0	0	0	0	0	0	0
20-24	11	1	0	0	0	12	5.4
25-29	44	12	2	1	1	60	26.8
30-35	125	14	7	2	4	152	67.9
Youth							
15-24	11	1	0	0	0	12	5.4
15-35	180	27	9	3	5	224	100
Female*	10	0	1	0	1	12	
15-19	0	0	0	0	0	0	0
20-24	2	0	1	0	0	3	25
25-29	2	0	0	0	0	2	16.7
30-35	6	0	0	0	1	7	58.3
Youth							
15-24	2	0	1	0	0	3	25
15-35	10	0	1	0	1	12	100
Percent of population							
15-24	1.1	1.0	2.0	0.0	0.0	1.1	
15-35	16.2	26.7	19.6	12.5	17.6	17.0	

The count of female aquaculture holders who are youth is too low for the computation of sex composition

6.3 Educational attainment of holders

6.3.1 Educational attainment of holders and production facility

A little over one-tenth (11.9%) of holders have never attended school. About 45 percent have attained basic education and more than one-fifth have attained tertiary level education.

The highest educational level attained by the largest proportion of holders who use ponds is basic education (47.4%), while for holders who use tanks, the highest educational level attained by the largest proportion (47.1%), is tertiary education. Almost equal proportion (about a third) of holders who produce in cages, and reservoirs have basic and tertiary education (Table 6.4).

Table 6.4: Aquaculture holders 15 years or older by educational attainment, and by production facility

Educational attainment	Production facility					Total	
	Pond	Cage	Dam/ Dug-out	Reservoir	Tank	Number	Percent
Total	1,176	101	51	24	34	1,386	
	100.0	100.0	100.0	100.0	100.0		100.0
Never attended	11.4	9.9	27.5	12.5	11.8	165	11.9
Basic education*	47.4	32.7	35.3	37.5	23.5	625	45.1
Secondary/vocational	14.7	15.8	19.6	12.5	11.8	206	14.9
Post-secondary diploma	6.0	5.9	0.0	4.2	5.9	80	5.8
Tertiary	20.5	35.6	17.6	33.3	47.1	310	22.4

* Basic education comprises Kindergarten, Primary and Junior High School education

6.3.2 Educational attainment and system of production

Holders engaged in monoculture and poly-culture have predominantly attained basic education (45.6 percent and 43.8 percent respectively). The majority of holders using the integrated system of production have at least secondary education (51.8%).

About the same proportion of holders involved in poly-culture systems have tertiary (17.6%) and secondary (17.0%) education (Table 6.5).

Table 6.5: Aquaculture holders 15 years or older by educational attainment, and by system of production

Educational attainment	System of production			Total	
	Monoculture	Poly-culture	Integrated	Number	Total
Total	1,183	176	27	1,386	100
Never attended	11.2	16.5	14.8	165	11.9
Basic education*	45.6	43.8	33.3	625	45.1
Secondary/vocational	14.6	17.0	11.1	206	14.9
Post-secondary diploma	5.8	5.1	7.4	80	5.8
Tertiary	22.8	17.6	33.3	310	22.4

* Basic education comprises of people who had Kindergarten, Primary and Junior High School education

6.3.3 Educational attainment of holders in aquaculture establishment

There is no marked difference in educational attainment of holders engaged in aquaculture with regards to the type of establishment. Holders with basic education constitute the highest proportion of holders for all three types of establishments, and those with post-secondary diploma, have the lowest proportion (Table 6.6).

Table 6.6: Aquaculture holders 15 years or older by educational attainment, and by type of production establishment

Educational attainment	Type of aquaculture production				
	Hatchery	Grow-out	Both	Total	
	Percent	Percent	Percent	Number	Percent
Total	227	793	366	1,386	100.0
Never attended	9.3	11.9	13.7	165	11.9
Basic education	49.8	42.9	47.0	625	45.1
Secondary/vocational	14.5	15.3	14.2	206	14.9
Post-secondary diploma	5.7	6.3	4.6	80	5.8
Tertiary	20.7	23.7	20.5	310	22.4

* Basic education comprises Kindergarten, Primary and Junior High School education

Literacy status of holders

Over 80.0 percent of holders in aquaculture (82.9%) and notably those using reservoir as a production facility (95.8%) can read and write in at least one language with understanding. More than two-thirds of holders using any facility are literate in English and Ghanaian language, except for holders using pond and dam/dug-out where 63.4 percent and 41.1 percent respectively are literate in both English and Ghanaian language. More males (82.8%) than females (71.7%) who are using pond, are literate in at least one language while for a specific language, more females (13.2%) and males (10.2%) are literate in English only (Table 6.7).

Table 6.7: Aquaculture holders 15 years or older by literacy status, language and sex, and by production facility

Literacy and sex	Pond	Cage	Dam/ Dug-out	Reservoir	Tank	Totals
Both Sexes						
Total	1,176	101	51	24	34	1,386
None (not literate)	17.7	12.9	21.6	4.2	14.7	17.2
Literate	82.3	87.1	78.4	95.8	88.2	82.9
Literate	968	88	40	23	30	1,149
English only	10.4	10.9	19.6	12.5	14.7	10.9
Ghanaian lang. only	7.2	5.9	15.7	12.5	2.9	7.4
Engl. and Gh'ian lang.	63.4	70.3	41.1	70.8	70.6	63.3
English and French	0.4	0.0	0.0	0.0	0.0	0.4
Engl, Frch. & Gh'ian lang.	0.4	0.0	0.0	0.0	0.0	0.4
Other languages	0.5	0.0	2.0	0.0	0.0	0.5
Male						
Total	1,123	98	49	22	29	1,321
None (not literate)	17.2	12.2	20.4	4.5	13.8	16.7
Literate	82.8	87.8	79.6	95.5	86.2	83.3
Literate	930	86	39	21	25	1,101
English only	10.2	11.2	20.4	13.6	10.3	10.7
Ghanaian lang. only	7.3	6.1	16.3	13.6	3.4	7.6
Engl. and Gh'ian lang.	64.0	70.5	42.9	68.3	72.5	63.8
English and French	0.4	0.0	0.0	0.0	0.0	0.3
Engl, Frch. & Gh'ian lang.	0.4	0.0	0.0	0.0	0.0	0.4
Other languages	0.5	0.0	0.0	0.0	0.0	0.5
Female						
Total	53	3	2	2	5	65
None (not literate)	28.3	33.3	50.0	0.0	20.0	26.2
Literate	71.7	66.7	50.0	100.0	100.0	73.8
Literate	38	2	1	2	5	48
English only	13.2	0.0	0.0	0.0	40.0	13.8
Ghanaian lang. only	5.7	0.0	0.0	0.0	0.0	4.6
Engl. and Gh'ian lang.	50.9	66.7	0.0	100.0	60.0	52.4
English and French	1.9	0.0	0.0	0.0	0.0	1.5
Engl, Frch. & Gh'ian lang.	0.0	0.0	0.0	0.0	0.0	0.0
Other languages	0.0	0.0	50.0	0.0	0.0	1.5

6.4 Disability status of aquaculture holders

The proportion of holders with disability who are into aquaculture is 1.1 percent. No holder who is using dam/dug-out has any form of disability. The proportions of female holders who have some form of disability is higher (1.5%) than males (1.1%). Only female holders using pond have some form of disability (Table 6.8).

Table 6.8: Aquaculture holders 15 years or older by disability status and sex, and by production facility

Disability status	Pond	Cage	Dam/ Dug-out	Reservoir	Tank	Total
Both sexes						
Total	1,182	102	52	24	34	1,394
Without Disability	98.8	99.0	100.0	100.0	100.0	98.9
With Disability	1.2	1.0	0.0	0.0	0.0	1.1
Male						
Total	1,129	99	50	22	29	1,329
Without Disability	98.8	99.0	100.0	100.0	100.0	98.9
With Disability	1.2	1.0	0.0	0.0	0.0	1.1
Female						
Total	53	3	2	2	5	65
Without Disability	98.1	100.0	100.0	100.0	100.0	98.5
With Disability	1.9	0.0	0.0	0.0	0.0	1.5

6.5 Holders in agro-ecological zones

Aquaculture holders are mostly in the forest zone (1,060) cultivating mainly tilapia (1,036). In all the ecological zones, except in the coastal savannah, there are more aquaculture holders in the rural areas than in the urban areas. In the coastal savannah zone, about two-thirds of the holders are in the urban areas. All the 18 aquaculture holders in the northern savannah zone rear only tilapia (Table 6.9).

Table 6.9: Aquaculture holders 15 years or older by type of species produced, and by agro-ecological zone and type of locality

Type of	Coastal savannah			Forest			Transitional zone			Northern savannah			Total		
Species	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	152	83	235	361	699	1,060	13	60	73	7	11	18	533	853	1,386
Tilapia	148	76	224	353	683	1,036	12	58	70	7	11	18	520	828	1,348
Catfish	2	5	7	7	10	17	1	1	2	0	0	0	10	16	26
Heterotis	1	2	3	1	4	5	0	0	0	0	0	0	2	6	8
Other	1	0	1	0	2	2	0	1	1	0	0	0	1	3	4

Of the 1,386 aquaculture holders, an overwhelming majority are males with females constituting less than 5 percent across the ecological zones. The female holders in both the coastal (12) and transitional zones (3) rear only tilapia and not the other species. In the northern savannah zone, only tilapia is cultured and this is done by only male holders (Table 6.10).

Table 6.10: Aquaculture holders 15 years or older by type of species produced, and by agro-ecological zone and sex of holder

Type of	Coastal Savannah			Forest			Transitional Zone			Northern Savannah			Total		
Species	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	223	12	235	1010	50	1060	70	3	73	18	0	18	1321	65	1386
Tilapia	212	12	224	988	48	1036	67	3	70	18	0	18	1285	63	1348
Catfish	7	0	7	17	0	17	2	0	2	0	0	0	26	0	26
Heterotis	3	0	3	4	1	5	0	0	0	0	0	0	7	1	8
Other	1	0	1	1	1	2	1	0	1	0	0	0	3	1	4

6.6 Aquaculture holders, production facility and system of production

The use of ponds by holders is predominant in all three systems of production, namely, monoculture, poly-culture and integrated. The corresponding proportions are 83.6, 92.0 and 92.6 percent. Male holders using ponds (945) constitute 83.9 percent of the male aquaculture holders practicing monoculture (1,127) while their female counterparts constitute 78.6 percent (44), see Table 6.11.

Table 6.11: Aquaculture holders 15 years or older by production facility, and by system of production and sex of holder

Production	Monoculture			Poly-culture			Integrated			Total		
facility	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	1,127	56	1,183	168	8	176	26	1	27	1,321	65	1,386
Pond	945	44	989	154	8	162	24	1	25	1,123	53	1,176
Cage	93	3	96	4	0	4	1	0	1	98	3	101
Dam/Dug-out	39	2	41	9	0	9	1	0	1	49	2	51
Reservoir	22	2	24	0	0	0	0	0	0	22	2	24
Tank	28	5	33	1	0	1	0	0	0	29	5	34

In all the three types of production systems, majority of holders engaged in aquaculture are in the rural areas. Among holders who dwell in rural areas, 61.1 percent (723 of 1,183), 65.3 percent (115 of 176) and 55.6 percent (15 of 27) practice monoculture, poly-culture and integrated system of production respectively. In rural areas, majority of holders (733 of 1,176) use ponds. With the exception of holders who use tanks and reservoirs, holders of the various types of facilities are more in the rural than in the urban areas across all systems of production (Table 6.12).

Table 6.12: Aquaculture holders 15 years or older by production facility, and by system of production and type of locality

Type of production facility	<u>Systems of production</u>											
	Monoculture			Poly-culture			Integrated			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	460	723	1,183	61	115	176	12	15	27	533	853	1,386
Pond	376	613	989	55	107	162	12	13	25	443	733	1,176
Cage	34	62	96	2	2	4	0	1	1	36	65	101
Dam/ Dug-out	19	22	41	4	5	9	0	1	1	23	28	51
Reservoir	12	12	24	0	0	0	0	0	0	12	12	24
Tank	19	14	33	0	1	1	0	0	0	19	15	34

For all the production facilities, holders predominantly use the grow-out type of production and a substantial number of holders combine both grow-out and hatchery. Out of 1,386 holders, 793 (57.2%) undertake the production of grow-out only, 366 (26.4%) engage in both hatchery and grow-out, and 227 (16.4%) run hatchery operations only. More hatchery operators (90.7%) use ponds compared to grow-out holders (81.8%), see Table 6.13.

Table 6.13: Aquaculture holders 15 years or older by production facility, and by type of production establishment

Type of production facility	Hatchery		Grow-out		Both hatchery & grow-out		Total	
	Number	%	Number	%	Number	%	Number	%
Total	227	100.0	793	100.0	366	100.0	1,386	100.0
Pond	206	90.7	649	81.8	321	87.7	1,176	84.8
Cage	11	4.8	74	9.3	16	4.4	101	7.3
Dam/Dug-out	4	1.8	35	4.4	12	3.3	51	3.7
Reservoir	3	1.3	14	1.8	7	1.9	24	1.7
Tank	3	1.3	21	2.6	10	2.7	34	2.5

Majority of aquaculture holders own or have inherited the holding (82.2%). The other common tenure arrangement of the 247 remaining holders are renting (97) and leasehold (69), see Table 6.14.

Table 6.14: Aquaculture holders 15 years or older by production facility, and by type of land tenure arrangement

Type of production facility	Own/free-holding	Inheritance	Leasehold	Renting	Share culture	Squatting	Trusteeship	Other	Total
Total	1,027	112	69	97	26	30	16	9	1,386
Pond	895	101	50	61	25	25	13	6	1,176
Cage	55	3	7	28	1	3	3	1	101
Dam/Dug-out	33	5	3	6	0	2	0	2	51
Reservoir	18	0	5	1	0	0	0	0	24
Tank	26	3	4	1	0	0	0	0	34

6.7 Aquaculture production and sales by species cultured and type of locality

The total fish produced in the 2017/18 cropping season was 18,134.5 mts. Tilapia (*Oreochromis niloticus*) was cultured the most, accounting for 18,092.4 mts (99.8%). Holders in urban areas cultured more fish (9,138.84 mts; 50.4%) compared to holders in rural areas (8,995.64 mts; 49.6%). Also, small-scale holders cultured 14.3 percent of the total production. Medium and large-scale holders cultured only tilapia species and accounted for 3.8 percent and 81.9 percent of the total production respectively.

About 40 percent of the total production was sold. Holders in rural areas sold more of their produce (4,154.16 mts; 58.6%) than holders in urban areas (2,934.80 mts). Medium and small-scale holders sold much higher proportions (72.2% and 60.2% respectively) of their produce compared to large-scale holders (33.9%).

The total operational cost of production was about GH¢13.1 million of which 56.3 percent was incurred by large-scale holders. More than one-third (37.5%) of the total cost was borne by small-scale holders while only 6.2 percent was incurred by medium-scale holders. The cost incurred by urban holders is higher than that of rural holders for medium and large-scale operators. The reverse is the case for large-scale operators (Table 6.15).

Table 6.15: Quantity of fish by type of species and scale of production, and by quantity produced, quantity sold, cost of production and type of locality

Type of species and scale of operation***	Quantity produced (metric tonnes*)			Quantity sold (metric tonnes *)			Cost of production (GH¢)**		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	9,138,836	8,995,641	18,134,477	2,934,801	4,154,161	7,088,962	6,476,824	6,658,798	13,135,622
Tilapia	9,123,559	8,968,839	18,092,398	2,921,866	4,134,299	7,056,165	6,431,739	6,596,529	13,028,268
Catfish	14,747	20,929	35,676	12,405	18,061	30,466	42,780	52,280	95,060
<i>Heterotis niloticus</i>	530	5,770	6,300	530	1,700	2,230	2,300	9,690	11,990
Other	0	103	103	0	101	101	0	304	304
Small-scale									
Total	924,836	1,674,591	2,599,427	535,801	1,029,161	1,564,962	2,058,044	2,872,518	4,930,562
Tilapia	909,559	1,647,789	2,557,348	522,866	1,009,299	1,532,165	2,012,959	2,810,249	4,823,208
Catfish	14,747	20,929	35,676	12,405	18,061	30,466	42,780	52,280	95,060
<i>Heterotis niloticus</i>	530	5,770	6,300	530	1,700	2,230	2,300	9,690	11,990
Other	0	103	103	0	101	101	0	304	304
Medium-scale									
Total	410,000	280,050	690,050	220,000	279,000	499,000	585,780	222,100	807,880
Tilapia	410,000	280,050	690,050	220,000	279,000	499,000	585,780	222,100	807,880
Large-scale									
Total	7,804,000	7,041,000	14,845,000	2,179,000	2,846,000	5,025,000	3,833,000	3,564,180	7,397,180
Tilapia	7,804,000	7,041,000	14,845,000	2,179,000	2,846,000	5,025,000	3,833,000	3,564,180	7,397,180

*Unit of measurement for conversion: 1,000kg=1mt

**Cost here excludes capital cost

***Small-scale Holders (produce less than 50,000kg), Medium-scale Holders (produce more than 50,000kg but less than 100,000kg) and Large-scale Holders (produce more than 100,000kg)

6.8 Quantity produced by system of production, type of establishment and species cultured

Monoculture, the most common production system, produced the highest output (17,408,554 mts), constituting 96.0 percent of fish while the integrated system produced the lowest, 33,225 mts (less than 1%). Production by the grow-out establishments is 7,770,875 mts, and this constitutes 44.6 percent of production through the monoculture system, while their counterparts engaged in hatchery produced 6,436,756 mts which is 37.0 percent.

Production from hatchery was significantly low under poly-culture (29,668 mts). Holders whose establishments combined hatchery and grow-out produced most of the output (23,772 mts) under the integrated system (Table 6.16).

Table 6.16: Quantity of fish by type of species and type of production establishment, and by system of production

Type of establishment	System of production			Total (metric tonnes *)
	Monoculture (metric tonnes)	Poly-culture (metric tonnes)	Integrated metric tonnes	
All types	17,408,554	692,698	33,225	18,134,477
Tilapia	17,371,705	687,871	32,822	18,092,398
Catfish	30,869	4,807	0	35,676
<i>Heterotis niloticus</i>	5,880	20	400	6,300
Other	100	0	3	103
Hatchery	6,436,756	29,668	4,300	6,470,724
Tilapia	6,426,206	27,668	4,300	6,458,174
Catfish	10,550	2,000	0	12,550
Grow-out	7,770,875	380,040	5,150	8,156,065
Tilapia	7,750,080	377,313	4,750	8,132,143
Catfish	14,815	2,707	0	17,522
<i>Heterotis niloticus</i>	5,880	20	400	6,300
Other	100	0	0	100
Both Hatchery and Grow-Out	3,200,923	282,990	23,775	3,507,688
Tilapia	3,195,419	282,890	23,772	3,502,081
Catfish	5,504	100	0	5,604
Other	0	0	3	3

* 1,000kg = 1mt

6.9 Aquaculture production and sales in agro-ecological zones

The forest zone produced the highest quantity of fish (9,321.6 mts) constituting 51.4 percent of total quantity produced, followed by coastal savannah, accounting for 47.8 percent. Almost all (99.6%) of the fish produced in the forest zone was tilapia at a cost of GHC 10,171,511. Out of the total tilapia produced, 5,499 mts were sold. Holders in the coastal savannah produced a total of 8,667.3 mts of tilapia at a cost of GHC 2,652,332. Only 16.9 percent (1,466.2 mts) of the quantity produced was sold. Production in the northern savannah 121.7 mts and transitional zone 14.8 mts were mainly tilapia.

In all the ecological zones, the proportions of quantities produced and sold were higher for the male aquaculture holders than the female holders. Further, male holders produced seven times the quantity produced by the female holders. Significant differentials persist in the agro-ecological zones. For the forest zone, male holders produced three times as much as female holders and sold twice as much. Aquaculture in the coastal zone was largely a male dominated activity. Male holders produced 272 times and sold 5,918 times as much as female holders. The three main types of species were cultured in all zones except the transitional zone. Of the total tilapia cultured by females, 98.4 percent occurred in the forest zone relative to 44.9 percent for their male counterparts. For males, most of the tilapia were cultured in the coastal zone (54.2%). In the transitional zone, there were only male holders who reared only tilapia (Table 6.17).

Operational cost per kilogram of tilapia produced varies from GHC 0.31 in coastal savannah to GHC 3.29 in the transitional zone.

Males in the forest zone sold a higher proportion (71.1%) of their total produce as compared to those in the other ecological zones—coastal (27.2%), transitional (0.1%), northern savannah (1.5%), see Table 6.17.

Table 6.17: Quantity of fish by type of species and sex of holder, and by agro-ecological zone, quantity sold, quantity produced and cost of production

	Coastal Savannah			Forest			Transitional zone			Northern Savannah			Total		
	Quantity Sold (metric tonnes)	Quantity produced (metric tonnes)	Cost of production (GHC)	Quantity Sold (metric tonnes)	Quantity produced (metric tonnes)	Cost of production (GHC)	Quantity Sold (metric tonnes)	Quantity produced (metric tonnes)	Cost of production (GHC)	Quantity Sold (metric tonnes)	Quantity produced (metric tonnes)	Cost of production (GHC)	Quantity Sold (metric tonnes)	Quantity produced (metric tonnes)	Cost of production (GHC)
Total															
Total	1,472,351	8,676,248	2,674,817	5,525,623	9,321,570	10,255,930	6,690	14,810	48,790	84,298	121,849	156,085	7,088,962	18,134,477	13,135,622
Row %	20.8%	47.8%	20.4%	77.9%	51.4%	78%	0.09%	0.08%	0.3%	1.2%	0.7%	1.2%	39.1%		
Tilapia	1,466,221	8,667,296	2,652,332	5,499,042	9,288,561	10,171,511	6,690	14,810	48,790	84,212	121,731	155,635	7,056,165	18,092,398	13,028,268
Catfish	5,800	8,622	18,080	24,581	26,939	76,630	0	0	0	85	115	350	30,466	35,676	95,060
Heterotis	330	330	4,400	1,900	5,970	7,590	0	0	0	0	0	0	2,230	6,300	11,990
Other	0	0	0	100	100	199	0	0	0	1	3	100	101	103	299
Male															
Total	1,447,888	8,644,533	2,648,957	3,784,765	7,160,547	10,146,350	6,690	14,810	48,790	81,097	117,547	152,553	5,320,440	15,937,437	12,996,650
Column %	98.3%	99.6%	99.0%	68.5%	76.8%	98.9%	100%	100%	100%	96.2%	96.5%	97.7%	75.1%	87.9%	98.9%
Row %	27.2%	54.2%	20.4%	71.1%	44.9%	78.1%	0.13%	0.09%	0.4%	1.5%	0.7%	1.2%			
Tilapia	1,441,758	8,635,581	2,626,472	3,759,284	7,132,638	10,063,841	6,690	14,810	48,790	81,011	117,429	152,103	5,288,743	15,900,458	12,891,206
Catfish	5,800	8,622	18,080	24,581	26,939	76,630	0	0	0	85	115	350	30,466	35,676	95,060
Heterotis	330	330	4,400	900	970	5,790	0	0	0	0	0	0	1,230	1,300	10,190
Other	0	0	0	0	0	0	0	0	0	1	3	100	1	3	100
Female															
Total	24,463	31,715	25,860	1,740,858	2,161,023	109,580	0	0	0	3,201	4,302	3,532	1,768,522	2,197,040	138,972
Column %	1.7%	0.4%	1%	31.5%	23.2%	1.2%				3.8%	3.5%	2.3%	24.9%	12.1%	1.1%
Row %	1.4%	1.4%	18.6%	98.4%	98.4%	78.9%	0.0	0.0	0.0	0.2%	0.2%	2.5%			
Tilapia	24,463	31,715	25,860	1,739,758	2,155,923	107,670	0	0	0	3,201	4,302	3,532	1,767,422	2,191,940	137,062
Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heterotis	0	0	0	1,000	5,000	1,800	0	0	0	0	0	0	1,000	5,000	1,800
Other	0	0	0	100	100	110	0	0	0	0	0	0	100	100	110

CHAPTER SEVEN

CAPTURE FISHERIES

7.1 Introduction

This chapter presents information on capture fishery operations (fishing in marine and inland waters) by households. Details on holders and persons engaged; types of vessels and ownership, fishing trips, fuel use, fishing gears and types of fish landed and sold are discussed.

7.2 Capture fishery holders

A total of 13,156 holders are involved in capture fishery activities with 9 in 10 undertaking fishery activities in inland waters. Inland fishing is prevalent in rural areas. In urban areas, about 1 in 3 (33.5%) holders undertake fishing activities in marine waters compared to less than 10 percent in rural areas. The capture fisheries sub-sector

A holder of capture fishery activity is an individual who owns, takes major decisions and exercises management control over the activity.

is male dominated in both urban (97.1%) and rural (98.5%) areas. Overall, males constitute 98.4 percent (12,941) of the holders. (Table 7.1).

Table 7.1: Capture fisheries holders 15 years or older by type of capture fisheries and type of locality, and by sex of holder

Type of capture fisheries/Type of locality	Holders in capture fisheries					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Total	12,941	100.0	215	100.0	13,156	100.0
Marine capture fisheries	1,172	9.1	17	7.9	1,189	9.0
Inland capture fisheries (fresh water)	11,723	90.6	198	92.1	11,921	90.6
Both marine and inland capture fisheries	46	0.4	0	0.0	46	0.4
Urban	1,175	100.0	35	100.0	1,210	100.0
Marine capture fisheries	395	33.6	10	28.6	405	33.5
Inland capture fisheries (fresh water)	751	63.9	25	71.4	776	64.1
Both marine and inland capture fisheries	29	2.5	0	0.0	29	2.4
Rural	11,766	100.0	180	100.0	11,946	100.0
Marine capture fisheries	777	6.6	7	3.9	784	6.6
Inland capture fisheries (fresh water)	10,972	93.3	173	96.1	11,145	93.3
Both marine and inland capture fisheries	17	0.1	0	0.0	17	0.1

7.2.1 Age of capture fisheries holders

Seven in ten of holders in capture fisheries are 36 years or older while only 2.7 percent are in the 15-24 years age group. The proportion of holders aged 60 years or older, who use semi-industrial vessels in urban areas are twice as high as the proportion who use canoes. The proportion of holders in urban areas in the age group of 36-59 years who use semi-industrial vessels (66.7%) is similar to holders who use canoe (68.0%). A similar pattern is observed for marine and inland fishing.

The proportion of males who use canoe in the urban areas and are 36 years or older (78.7%) is higher

than their female counterparts (68.5%). Conversely, the proportion of females who use canoe in the

rural areas and are 36 years or older (86.6%) is higher than their male counterparts (71.3%). Only two female holders are using semi-industrial vessels and there is no female holder younger than 36 years who is engaged in marine fishing (Table 7.2).

Table 7.2: Capture fisheries holders 15 years or older by age and sex, and by type of vessels used, type of capture fisheries and, type of locality

Age group	Canoe		Semi-industrial vessel		Marine		Inland		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both Sexes											
Total	1,181	11,738	30	208	431	796	779	11,150	1,210	11,946	13,156
15-19	0.2	0.3	0.0	0.0	0.2	0.1	0.1	0.3	0.2	0.3	0.3
20-24	1.4	2.5	0.0	1.9	0.7	1.9	1.8	2.6	1.4	2.5	2.4
25-29	6.6	7.6	3.3	5.3	4.2	4.8	7.7	7.8	6.4	7.6	7.5
30-35	13.4	18.1	10.0	17.8	9.5	16.3	15.4	18.2	13.3	18.1	17.7
36-59	68.0	62.0	66.7	67.8	71.5	66.1	66.1	61.8	68.0	62.1	62.7
60+	10.4	9.5	20.0	7.2	13.9	10.8	8.9	9.3	10.7	9.4	9.5
Male											
Total	1,146	11,559	29	207	421	789	754	10,977	1,175	11,766	12,941
15-19	0.2	0.3	0.0	0.0	0.2	0.1	0.1	0.3	0.2	0.3	0.3
20-24	1.3	2.5	0.0	1.9	0.7	1.9	1.6	2.6	1.3	2.5	2.4
25-29	6.5	7.6	3.4	4.8	4.3	4.6	7.7	7.8	6.5	7.6	7.4
30-35	13.3	18.3	10.3	17.9	9.7	16.5	15.1	18.4	13.2	18.3	17.5
36-59	68.3	61.9	69.0	68.1	71.3	66.3	66.7	61.7	68.3	62.0	61.6
60+	10.4	9.3	17.2	7.2	13.8	10.6	8.8	9.2	10.6	9.3	9.3
Female											
Total	35	179	1	1	10	7	25	173	35	180	215
15-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-24	5.7	1.7	0.0	0.0	0.0	0.0	8.0	1.7	5.7	1.7	0.0
25-29	8.6	4.5	0.0	100.0	0.0	28.6	8.0	4.0	5.7	5.0	0.1
30-35	17.1	7.3	0.0	0.0	0.0	0.0	24.0	7.5	17.1	7.2	0.1
36-59	57.1	68.2	0.0	0.0	80.0	42.9	48.0	68.8	57.1	67.8	1.1
60+	11.4	18.4	100.0	0.0	20.0	28.6	12.0	17.9	14.3	18.3	0.3

7.2.2 Youth 15-35 years in capture fisheries

The youth population of holders who engage in capture fisheries is 3,657. Most holders of capture fisheries are persons older than 24 years. About 64.0 percent of the youth engaged in capture fisheries are in the 30-35 years age group while a little over a quarter are in the 25-29 years age group. A similar pattern is observed for males while for females, a little over half (54.3%) is in the 30-35 years age group and about a third (31.4%) is in the 25-29 years age group.

Canoes are the most common vessels used by the youth. A total of 3,601 representing 98.5 percent of youth holders in capture fisheries use canoe, of which majority (92.9%) are in the rural areas. Almost all the youth holders in capture fisheries are males (92.9%). A similar pattern is observed for youth holders in rural areas who use canoe and among inland fishing. (Table 7.3).

Table 7.3: Capture fisheries holders 15-35 years (youth) by age and sex, and by type of vessels used, type of capture fisheries and type of locality

Age group	Fishing vessels				Type of capture fisheries				Total holders			
	Canoe		Semi-industrial vessel		Marine		Inland					
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total	%
Both Sexes	1,181	11,738	30	208	431	796	779	11,150	1,210	11,946	13,156	
Total	255	3346	4	52	63	184	195	3214	258	3398	3656	100
15-19	2	32	0	0	1	1	1	31	2	32	34	0.9
20-24	17	296	0	4	3	15	14	285	17	300	317	8.7
25-29	78	892	1	11	18	38	60	865	78	903	981	26.8
30-35	158	2126	3	37	41	130	121	2033	161	2163	2324	63.6
Youth												
15-24	19	328	0	4	4	16	15	316	19	332	351	
15-35	255	3346	4	52	63	184	196	3214	259	3398	3657	
Male												
Total	244	3,322	4	51	63	182	185	3,191	248	3,373	3,621	100
15-19	2	32	0	0	1	1	1	31	2	32	34	0.9
20-24	15	293	0	4	3	15	12	282	15	297	312	8.6
25-29	75	884	1	10	18	36	58	858	76	894	970	26.8
30-35	152	2,113	3	37	41	130	115	2,020	155	2150	2305	63.7
Youth												
15-24	17	325	0	4	4	16	13	313	17	329	346	
15-35	244	3322	4	51	63	182	186	3191	249	3373	3622	
Female												
Total	11	24	0	1	0	2	10	23	10	25	35	100
15-19	0	0	0	0	0	0	0	0	0	0	0	0.0
20-24	2	3	0	0	0	0	2	3	2	3	5	14.3
25-29	3	8	0	1	0	2	2	7	2	9	11	31.4
30-35	6	13	0	0	0	0	6	13	6	13	19	54.3
Youth												
15-24	2	3	0	0	0	0	2	3	2	3	5	
15-35	11	24	0	1	0	2	10	23	10	25	35	
Percent of population												
15-24	1.6	2.8	0.0	1.9	0.9	2.0	1.9	2.8	1.6	2.8	2.7	
15-35	21.6	28.5	13.3	25.0	14.6	23.1	25.2	28.8	21.4	28.4	27.8	

7.2.3 Educational attainment and literacy status of holders

The highest educational attainment of majority of capture fisheries holders (50.8%) is basic education. About four in ten (42.0%) have never attended school while under one percent (0.9%) have attained only tertiary education. A similar pattern is observed among holders in the rural and urban areas, however, slightly higher proportions have attained basic education, secondary, post-secondary education and tertiary education in the urban than in the rural areas. More females (63.3%) than males (41.6%) have never attended school and the proportion is higher in the rural (66.1%) than in the urban (48.6%) areas. (Table 7.4).

Table 7.4: Capture fisheries holders 15 years or older by educational attainment and sex, and by type of vessels used, type of capture fisheries and type of locality

Highest level of educational attainment	Canoe		Semi-industrial vessel		Marine		Inland		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both sexes											
Total	1,180	11,738	30	208	431	796	779	11,150	1,210	11,946	13,156
Never attended	32.3	42.9	30.0	42.8	33.9	36.6	31.3	43.4	32.2	42.9	42.0
Basic education	57.3	50.2	53.3	47.1	56.6	55.8	57.5	49.7	57.2	50.1	50.8
Secondary/Vocational	8.1	5.9	3.3	8.7	7.0	6.4	8.5	5.9	7.9	5.9	6.1
Post-Secondary Dipl.	0.6	0.2	6.7	0.5	1.2	0.4	0.5	0.2	0.7	0.2	0.3
Tertiary	1.8	0.8	6.7	1.0	1.4	0.9	2.2	0.8	1.9	0.8	0.9
Male											
Total	1,146	11,559	29	207	421	789	754	10,977	1,175	11,766	12,941
Never attended	31.8	42.6	27.6	42.5	33.3	36.2	30.9	43.0	31.7	42.6	41.6
Basic education	57.6	50.5	55.2	47.3	57.0	56.0	57.8	50.0	57.5	50.4	51.1
Secondary/Vocational	8.1	5.9	3.4	8.7	7.1	6.5	8.5	5.9	8.0	6.0	6.2
Post-Secondary Dipl.	0.6	0.2	6.9	0.5	1.2	0.4	0.5	0.2	0.8	0.2	0.3
Tertiary	1.8	0.8	6.9	1.0	1.4	0.9	2.3	0.8	2.0	0.8	0.9
Female											
Total	34	179	1	1	10	7	25	173	35	180	215
Never attended	47.1	65.9	100.0	100.0	60.0	71.4	44.0	65.9	48.6	66.1	63.3
Basic education	47.1	31.3	0.0	0.0	40.0	28.6	48.0	31.2	45.7	31.1	33.5
Secondary/Vocational	5.9	2.8	0.0	0.0	0.0	0.0	8.0	2.9	5.7	2.8	3.3
Post-Secondary Dipl.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tertiary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Literacy status of capture fisheries holders

Majority of holders engaged in capture fisheries are not literate. More than half (51.3%) of holders in capture fisheries cannot read and write in any language with understanding. Only about a quarter of holders can read and write in English and a Ghanaian language whereas 12.3 percent can read and write in only a Ghanaian language with understanding. The pattern is similar for the type of vessels and types of fishing; however, the proportions are higher in urban than in rural areas.

More females (65.6%) than males (51.1%) are non-literate and the proportion that can read and write English and a Ghanaian Language is higher in urban (34.8%) than in rural (24.7%) areas for both males and females. (Table 7.5).

Table 7.5: Capture fisheries holders 15 years or older by literacy status, language and sex, and by type of vessels used, type of capture fisheries and type of locality

Literacy	Canoe		Semi-industrial vessel		Marine		Inland		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both Sexes											
Total	1,180	11,738	30	208	431	796	779	11,150	1,210	11,946	13,156
None (not literate)	45.7	51.8	56.7	53.4	52.9	44.3	42.1	52.3	46.0	51.9	51.3
Literate	54.3	48.2	43.3	46.6	47.1	55.7	57.9	47.7	54.0	48.1	48.7
Literate											
<i>English only</i>	8.4	9.3	6.7	11.1	4.9	7.0	10.3	9.5	8.3	9.4	9.3
<i>Ghanaian lang. only</i>	10.1	12.6	10.0	11.5	9.0	14.7	10.7	12.4	10.1	12.5	12.3
<i>Engl. and Gh'ian lang.</i>	35.0	24.9	26.7	22.5	32.7	31.5	36.0	24.4	34.8	24.7	25.8
<i>English and French</i>	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.1	0.0	0.1	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0
<i>Other languages</i>	0.6	1.4	0.0	1.0	0.0	2.4	0.9	1.3	0.6	1.4	1.3
Male											
Total	1,146	11,559	29	207	421	789	754	10,977	1,175	11,766	12,941
None (not literate)	45.3	51.6	55.2	53.6	53.2	44.2	41.2	52.1	45.5	51.7	51.1
Literate	54.7	48.4	44.8	46.4	46.8	55.8	58.8	47.9	54.5	48.3	48.9
Literate											
<i>English only</i>	8.5	9.5	6.9	11.1	5.0	7.1	10.3	9.7	8.4	9.5	9.4
<i>Ghanaian lang. only</i>	10.0	12.4	10.3	11.1	8.3	14.6	11.0	12.3	10.0	12.4	12.2
<i>Engl. and Gh'ian lang.</i>	35.4	25.0	27.6	22.7	33.0	31.6	36.6	24.5	35.3	24.9	25.9
<i>English and French</i>	0.0	0.1	0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.1	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0
<i>Other languages</i>	0.6	1.4	0.0	1.0	0.0	2.4	0.9	1.4	0.6	1.4	1.4
Female											
Total	34	179	1	1	10	7	25	173	35	180	215
None (not literate)	58.8	67.0	100.0	0.0	40.0	57.1	68.0	67.1	60.0	66.7	65.6
Literate	41.2	33.0	0.0	100.0	60.0	42.9	32.0	32.9	40.0	33.3	34.4
Literate											
<i>English only</i>	5.9	0.6	0.0	0.0	0.0	0.0	8.0	0.6	5.7	0.6	1.4
<i>Ghanaian lang. only</i>	11.8	20.6	0.0	100.0	40.0	28.6	0.0	20.7	11.4	21.0	19.5
<i>Engl. and Gh'ian lang.</i>	23.5	11.2	0.0	0.0	20.0	14.3	24.0	11.0	22.9	11.1	13.0
<i>English and French</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Engl, Frch. & Gh'ian lang.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other languages</i>	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.5

7.2.4 Nationality of capture fisheries holders

Almost all holders (99.8%) in capture fisheries are Ghanaian. The proportion of non-Ghanaian holders is higher among marine fishing (0.6%) than inland (0.2%). Additionally, all holders who use semi-industrial vessels and all female holders are Ghanaian (Table 7.6).

Table 7.6: Capture fisheries holders 15 years or older by nationality and sex, and by type of vessels used and type of capture fisheries

<u>Nationality</u>	<u>Canoe</u>	<u>Semi-industrial vessel</u>	<u>Marine</u>	<u>Inland</u>	<u>Total</u>
Both sexes	12,918	238	1,227	11,928	13,156
Ghanaian	99.8	100.0	99.4	99.8	99.8
Non-Ghanaian	0.2	0.0	0.6	0.2	0.2
Benin	0.0	0.0	0.0	0.0	0.0
Cote d'Ivoire	0.0	0.0	0.1	0.0	0.0
Nigeria	0.0	0.0	0.0	0.1	0.0
Togo	0.0	0.0	0.1	0.0	0.0
Other African	0.1	0.0	0.4	0.1	0.1
Male					
Ghanaian	99.8	100.0	99.4	99.8	99.8
Non-Ghanaian	0.2	0.0	0.6	0.2	0.2
Benin	0.0	0.0	0.0	0.0	0.0
Cote d'Ivoire	0.0	0.0	0.1	0.0	0.0
Nigeria	0.0	0.0	0.0	0.1	0.0
Togo	0.0	0.0	0.1	0.0	0.0
Other African	0.1	0.0	0.4	0.1	0.1
Female					
Ghanaian	100.0	100.0	100.0	100.0	100.0
Non-Ghanaian	0.0	0.0	0.0	0.0	0.0
Benin	0.0	0.0	0.0	0.0	0.0
Cote d'Ivoire	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0
Togo	0.0	0.0	0.0	0.0	0.0
Other African	0.0	0.0	0.0	0.0	0.0

7.2.5 Disability status of capture fisheries holders

The proportion of holders engaged in capture fisheries with a form of disability is 0.9 percent. This is also the case in rural areas but slightly lower in urban areas. In addition, the proportions of holders engaged in capture fisheries with some form of disability are higher among those who fish in marine waters in both urban and rural areas than inland fishing. Generally, the proportions of female holders who have some form of disability is higher (1.9%) than males (0.9%). For females, only those who are using canoe in inland waters have some form of disability. Female holders and users of semi-industrial vessels in urban areas do not have any form of disability. (Table 7.7).

Table 7.7: Capture fisheries holders 15 years or older by disability status, and by type of vessels used, type of capture fisheries, and type of locality

Disability status	Canoe		Semi-industrial vessel		Marine		Inland		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both sexes											
Total	1,180	11,738	30	208	431	796	779	11,150	1,210	11,946	13,156
Without Disability	99.3	99.1	100.0	99.0	98.8	98.7	99.6	99.1	99.3	99.1	99.1
With Disability	0.7	0.9	0.0	1.0	1.2	1.3	0.4	0.9	0.7	0.9	0.9
Male											
Total	1,146	11,559	29	207	421	789	754	10,977	1,175	11,766	12,941
Without Disability	99.3	99.1	100.0	99.0	98.8	98.9	99.6	99.1	99.3	99.1	99.1
With Disability	0.7	0.9	0.0	1.0	1.2	1.1	0.4	0.9	0.7	0.9	0.9
Female											
Total	34	179	1	1	10	7	25	173	35	180	215
Without Disability	100.0	97.8	100.0	100.0	100.0	85.7	100.0	98.3	100.0	97.8	98.1
With Disability	0.0	2.2	0.0	0.0	0.0	14.3	0.0	1.7	0.0	2.2	1.9

7.3 Migration of capture fishery holders

About one in ten (12.4%) holders in capture fisheries are migrants. The prevalence of migration among holders of marine fishing is higher than that of inland fishing. The proportion of holders in urban areas (23.6%) who migrated is twice as high as for rural (11.3%). For the urban areas, the proportion of migrants holders in marine fishing is much higher (35.7%) than for inland (16.9%) and similarly for rural areas, the rate for marine (19.3%) is almost twice that of inland (Table 7.8).

Migration: This occurs when a person has moved out of the household for at least a year or intends to stay out of the household for at least a year.

Table 7.8: Capture fisheries holders 15 years or older by type of capture fisheries and type of locality, and by migration status

Type of fishing/ type of locality	Migration status						Percent of migrants
	Total		Migrated		Did not migrate		
	Number	%	Number	%	Number	%	
Total	13,156	100.0	1,634	100.0	11,522	100.0	12.4
Marine	1,227	9.3	308	18.8	919	8.0	25.1
Inland	11,929	90.7	1,326	81.2	10,603	92.0	11.1
Urban							
Total	1,210	100.0	286	100.0	924	100.0	23.6
Marine	431	35.6	154	53.8	277	30.0	35.7
Inland	779	64.4	132	46.2	647	70.0	16.9
Rural							
Total	11,946	100.0	1,348	100.0	10,598	100.0	11.3
Marine	796	6.7	154	11.4	642	6.1	19.3
Inland	11,150	93.3	1,194	88.6	9,956	93.9	10.7

7.4 Persons engaged in capture fisheries

Out of 70,396 persons engaged in capture fisheries, more than two-thirds (68.7%) are males. Of those engaged, 92.0% are engaged in inland fishing only and 7.6 percent are engaged in marine fishing only. About 46 percent (32,094) are paid employees of which 8 in 10 are males in both urban and rural areas.

About 90 percent of paid employees in capture fisheries are in rural areas. There is a higher proportion of paid employees in inland fishing in rural (93.9%) than in urban (74.2%) areas.

Over 50 percent of males engaged in capture fisheries are paid employees. For females, only about 30 percent are paid. The proportions of persons engaged in inland and marine fisheries who are paid, are just about the same (45.7% and 45.3% respectively). For persons engaged in both inland and marine activities, only 9 percent of females are paid compared to about 45 percent of males with a wider gap in urban than in rural areas (Table 7.9).

Table 7.9: Persons 15 years or older by type of capture fisheries and type of locality, and by persons engaged and persons employed in capture fisheries

Type of capture fisheries/ Type of locality	Persons engaged						Paid employees						Paid employees as percent of persons engaged		
	Male		Female		Total		Male		Female		Total		Male	Female	Total
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	%	%	%
Total	48,367	100.0	22,029	100.0	70,396	100.0	25,188	100.0	6,906	100.0	32,094	100.0	52.1	31.3	45.6
Marine capture fisheries only	3,814	7.9	1,532	7.0	5,346	7.6	1,977	7.8	446	6.5	2,423	7.5	51.8	29.1	45.3
Inland capture fisheries only	44,341	91.7	20,420	92.7	64,761	92.0	23,116	91.8	6,453	93.4	29,569	92.1	52.1	31.6	45.7
Both Marine and Inland capture	212	0.4	77	0.3	289	0.4	95	0.4	7	0.1	102	0.3	44.8	9.1	35.3
Urban															
Total	4,191	100.0	1,736	100.0	5,927	100.0	2,392	100.0	558	100.0	2,950	100.0	57.1	32.1	49.8
Marine capture fisheries only	1,206	28.8	453	26.1	1,659	28.0	580	24.2	118	21.1	698	23.7	48.1	26.0	42.1
Inland capture fisheries only	2,869	68.5	1,246	71.8	4,115	69.4	1,753	73.3	436	78.1	2,189	74.2	61.1	35.0	53.2
Both Marine and Inland capture	116	2.8	37	2.1	153	2.6	59	2.5	4	0.7	63	2.1	50.9	10.8	41.2
Rural															
Total	44,176	100.0	20,293	100.0	64,469	100.0	22,796	100.0	6,348	100.0	29,144	100.0	51.6	31.3	45.2
Marine capture fisheries only	2,608	5.9	1,079	5.3	3,687	5.7	1,397	6.1	328	5.2	1,725	5.9	53.6	30.4	46.8
Inland capture fisheries only	41,472	93.9	19,174	94.5	60,646	94.1	21,363	93.7	6,017	94.8	27,380	93.9	51.5	31.4	45.1
Both Marine and Inland capture	96	0.2	40	0.2	136	0.2	36	0.2	3	0.0	39	0.1	37.5	7.5	28.7

7.5 Types of fishing vessels used

Canoe is the dominant vessel used for both inland (100.0%) and marine (80.3%) fishing. Semi-industrial vessels are used only in marine fishing. (Table 7.10)

Table 7.10: Capture fisheries holders 15 years or older by type of ownership of vessel used, and by type of capture fisheries

Type of fishing vessel used	Type of capture fisheries				Total	
	Marine		Inland			
	Number	%	Number	%	Number	%
Total	1,227	100.0	11,929	100.0	13,156	100.0
Canoe	985	80.3	11,929	100.0	12,914	98.2
Semi-industrial vessel	238	19.4	0	0.0	238	1.7
Both	4	0.3	0	0.0	4	0.0

7.6 Canoe ownership

Nearly 8 in 10 holders use canoes fully owned by the holders. The rate is higher for males (79.8%) than females (60.8%). This sex differential is similar for inland fishing, but in the case of marine fishing, just about half of female and male holders fully owned the canoes used for fishing. One-fifth of the holders use hired canoes (8.1%), while those who use jointly owned and hired canoes constitute 3.4 percent and 8.1 percent respectively. Whereas close to one-fifth of females use hired canoes, only 7.9 percent of males use hired canoes. Also, about one out of every 10 holders depend on free use of vessels for fishing activities. Nine percent of men and 18.4 percent of women depend on free use of vessels for their fishing activities.

The reliance on free use of canoes is more common with marine (19.5%) than inland (8.2%) fishing. Close to 91 percent (11,945 of 12,912) of holders in capture fisheries operate in inland waters. About 12 percent of canoes used in marine fishing are jointly owned (Table 7.11).

Table 7.11: Capture fisheries holders 15 years or older by type of ownership of canoe and type of capture fisheries, and by sex

Canoe ownership/type of capture fisheries	Sex of holder					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Total	12,700	100.0	212	100.0	12,912	100.0
Fully owned	10,134	79.8	129	60.8	10,263	79.5
Hired	1,001	7.9	40	18.9	1,041	8.1
Jointly owned	440	3.5	4	1.9	444	3.4
Free use	1,125	8.9	39	18.4	1,164	9.0
Marine						
Total	952	100.0	15	100.0	967	100.0
Fully owned	495	52.0	8	53.3	503	52.0
Hired	158	16.6	5	33.3	163	16.9
Jointly owned	112	11.8	0	0.0	112	11.6
Free use	187	19.6	2	13.3	189	19.5
Inland						
Total	11,748	100.0	197	100.0	11,945	100.0
Fully owned	9,639	82.0	121	61.4	9,760	81.7
Hired	843	7.2	35	17.8	878	7.4
Jointly owned	328	2.8	4	2.0	332	2.8
Free use	938	8.0	37	18.8	975	8.2

7.7 Fishing gears used by holders

The most used fishing gears by holders are set net (56.6%), cast net (33.7%) and traps (20.6%). However, the use of trap features more significantly in inland fishing as well as with the use of canoes. Cast net (28.2%) and set net (26.9%) are almost equally used in marine fishing. For inland fishing, set net (59.6%) is most commonly used, followed by cast net (34.3%). The other fishing gears used by holders are purse seine (20.4%) and beach seine (19.0%). The most used gear on semi-industrial vessels is cast net (45.4%) and for canoe, it is the set net (56.9%), see Table 7.12.

Table 7.12: Capture fisheries holders 15 years or older by type of capture fisheries and by type of vessel, and by type of fishing gears

Type of capture / Type of vessel	Type of fishing gear												Number of household holders
	Purse seine (Poli/Watsa)	Hook & Line	Drift Gill Net	Beach Seine	Ali	Set Net	Cast net	Nifa-nifa	Atigya	Bamboo	Traps	Other	
Total	3.7	17.8	3.9	3.9	1.9	56.6	33.7	2.0	8.2	7.3	20.6	5.9	13,143
Type of capture fisheries													
Marine	20.4	11.1	4.5	19.0	2.4	26.9	28.2	5.3	1.5	1.8	3.8	4.7	1,225
Inland	2.0	18.5	3.9	2.4	1.9	59.6	34.3	1.7	8.9	7.9	22.3	6.0	11,918
Type of vessel													
Canoe	3.7	17.8	3.9	3.9	1.9	56.9	33.5	2.0	8.3	7.4	20.8	5.8	12,901
Semi-industrial	6.3	19.7	6.7	6.7	0.8	36.6	45.4	0.4	4.6	5.5	8.0	8.8	238

7.8 Number of fishing trips per week

Holders typically make five to nine fishing trips a week for both marine and inland fishing irrespective of the type of vessel used. More than one-quarter (28.2%) of holders undertake up to five trips per week, and a tenth embark on ten trips or more. A similar pattern is observed for those who use canoes and semi-industrial vessels (Table 7.13).

Table 7.13: Capture fisheries holders 15 years or older by number of fishing trips per week, and by type of vessel and type of capture fisheries

Number of fishing trips per week	Type of vessel				Type of fishing				Total	
	Canoe		Semi-industrial vessel		Marine		Inland			
	Number	%	Number	%	Number	%	Number	%	Number	%
Total	12,914	100.0	238	100.0	1,227	100.0	11,929	100.0	13,156	100.0
4-5	3,630	28.1	79	33.2	455	37.1	3,256	27.3	3,711	28.2
5-9	8,024	62.1	143	60.1	673	54.8	7,495	62.8	8,168	62.1
10-14	970	7.5	9	3.8	75	6.1	904	7.6	979	7.4
15+	290	2.2	7	2.9	24	2.0	274	2.3	298	2.3

7.9 Time spent on fishing trips

Fishing trips generally last for less than ten hours. About 87.3 percent of canoe users and 77.7 percent of semi-industrial vessel users spend less than ten hours on a fishing trip. Yet, more than one-third (37.0%) of holders in marine fishing spend at least 10 hours per trip while for inland fishing, just about 10 percent spend 10 hours or more per trip (Table 7.14).

Table 7.14: Capture fisheries holders 15 years or older by time spent (hours) on fishing trip, and by vessel type and by type of capture fisheries

Time spent (hours) on fishing trip	Type of vessel				Type of fishing					
	Canoe		Semi-industrial vessel		Marine		Inland		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total	12,914	100.0	238	100.0	1,227	100.0	11,929	100.0	13,156	100.0
0-9	11,276	87.3	185	77.7	773	63.0	10,692	89.6	11,465	87.1
10-15	1,205	9.3	34	14.3	342	27.9	897	7.5	1,239	9.4
16-20	165	1.3	8	3.4	36	2.9	137	1.1	173	1.3
21+	268	2.1	11	4.6	76	6.2	203	1.7	279	2.1

7.10 Availability of premix fuel

Only about one-fifth (22.2%) of holders who use outboard motors in capture fisheries reported that premix fuel is available when needed. A higher proportion of holders in marine (68.8%) and in inland (80.0%) fishing do not have premix fuel readily available.

Among urban holders, premix is more readily available to those engaged in marine fishing (34.4%) than inland fishing (13.7%). There is little difference in the availability of premix for those engaged in marine and inland fishing in rural areas while for urban areas, there is a 20 percentage point difference in availability of premix fuel between marine and inland fishing (Table 7.15).

Table 7.15: Capture fisheries holders 15 years or older by type of capture fisheries and type of locality and by availability of premix fuel to holders

Type of capture fisheries	Available	Not Available	Total	Number
Total	22.2	77.8	100.0	3,094
Marine	31.2	68.8	100.0	600
Inland	20.0	80.0	100.0	2,494
Urban				
Total	25.9	74.1	100.0	514
Marine	34.4	65.6	100.0	302
Inland	13.7	86.3	100.0	212
Rural				
Total	27.9	72.1	100.0	2,580
Marine	20.6	79.4	100.0	298
Inland	21.4	78.6	100.0	2,282

7.11 Fish landings

A total of 430,454.9 mts of fish was landed by canoes and semi-industrial vessels engaged in capture fisheries in 2017/18 cropping season. Landings from marine capture (343,282.6 mts) accounted for about 79.7 percent of the total landings. By vessel type, canoes contributed 89.4 percent of the total landings. About sixty three percent (62.8%) of the total landings were sold. A higher proportion of landings from inland fishing was sold (81.3%) compared to (58.2%) from marine fishing. The landings from marine fishing were about 4 times that of inland. For semi-industrial vessels, only one-third of total landings were sold (Table 7.16).

Table 7.16: Quantity of fish (mts) by type of vessels and type of capture fisheries, and by quantity landed and quantity sold

Type of Vessel/ Type of fishing	Quantity (mts)		Sold(mts)	% landings sold
	Caught / Landed (mts)	%		
Total (Marine and Inland)Total	430,454.9	100.0	270,534.6	62.8
Canoe	384,897.5	89.4	255,364.3	66.3
Semi-industrial	45,556.4	10.6	15,169.4	33.3
Both	1.0	0.0	0.9	91.5
Marine				
Total	343,282.6	100.0	199,678.6	58.2
Canoe	297,725.3	86.7	184,508.3	62.0
Semi-industrial	45,556.4	13.3	15,169.4	33.3
Both	1.0	0.0	0.9	91.5
Inland				
Total	87,172.2	100.0	70,856.0	81.3
Canoe	87,172.2	100.0	70,856.0	81.3
Semi-industrial	0.0	0.0	0.0	0.0
Both	0.0	0.0	0.0	0.0

7.12 Value of fish landed and sold

The total value of fish landed from marine and inland capture in both rural and urban areas is estimated at GH¢ 5,692,441,170. The value of landings from canoes (GH¢ 5,326,800,467) constitute 93.6 percent of the total value of fish landed. The value of landings for rural (GH¢ 2,522,099,602) and urban (GH¢ 3,170,341,568) holders constitute 44.3 percent and 55.7 percent respectively (Table 7.17).

Table 7.17: Value of fish landings (GH¢) by type of capture fisheries and type of locality, and by type of vessel

Type of fishing/ Type of locality	Value of Fish Landed (GH¢)			Total
	Canoe	Semi-Industrial	Both	
Total	5,326,800,467	365,478,273	162,430	5,692,441,170
Marine	4,595,658,780	365,478,273	162,430	4,961,299,483
Inland	731,141,687			731,141,687
Urban				
Total	3,147,169,582	23,168,756	3,230	3,170,341,568
Marine	3,139,561,124	23,168,756	3,230	3,162,733,110
Inland	7,608,458			7,608,458
Rural				
Total	2,179,630,885	342,309,517	159,200	2,522,099,602
Marine	1,456,097,656	342,309,517	159,200	1,798,566,373
Inland	723,533,229			723,533,229

7.13 Fish species landed

One-fifth of the total fish landed is from inland fishing and four-fifth of the landed fish were sold. Five major marine species landed, namely, anchovy (27.9%), cassava/croaker (17.4%), herring (13.9%), tuna (7.1%), and mackerel (9.2%), accounted for 75.5 percent of the total landings. In all, 58.2 percent of the total marine species landed were sold. For some marine species, less than 20 percent of the quantity landed were sold, namely, cassava (14.9%), roncador (14.9%), meagre (12.2%), sharks (10.8%) and buro (8.0%). See Table 7.18.

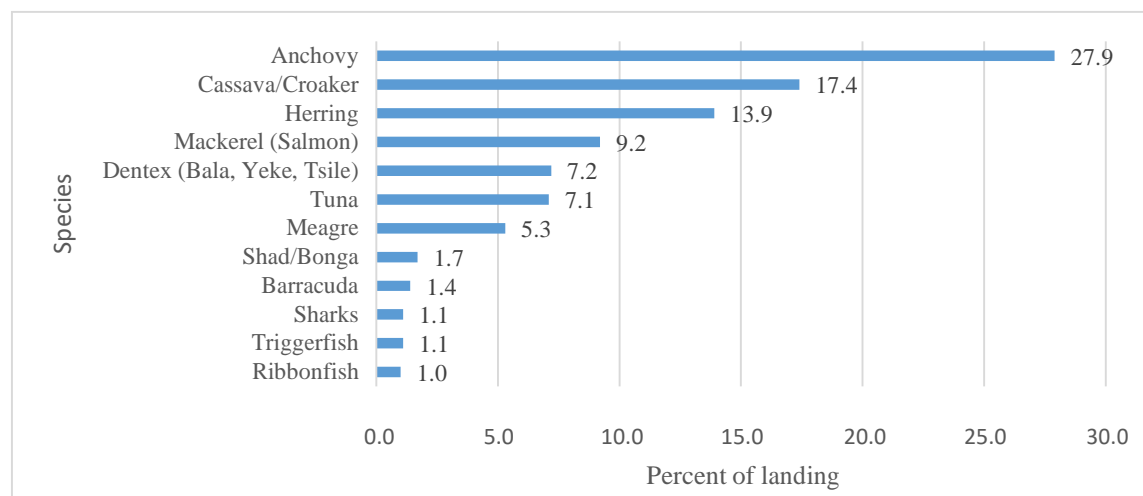
**Table 7.18: Quantity of marine fish (mts) by type of species,
and by quantity landed and quantity sold**

Species of fish	Quantity landed (mts)		Quantity sold (mts)	
	Number	%	Number	%
All species				
Total	430,455	100.0	270,535	62.8
marine	343,283	79.7	199,679	58.2
Inland	87,172	20.3	70,856	81.3
Marine species				
Total	343,283	100.0	199,679	58.2
Anchovy	95,880	27.9	47,067	49.1
Cassava/Croaker	59,797	17.4	8,936	14.9
Herring	47,771	13.9	37,569	78.6
Mackerel (Salmon)	31,643	9.2	29,850	94.3
Dentex (Bala, Yeke, Tsile)	24,701	7.2	21,671	87.7
Tuna	24,333	7.1	22,596	92.9
Meagre	18,146	5.3	2,207	12.2
Shad/Bonga	5,675	1.7	4,950	87.2
Barracuda	4,793	1.4	4,366	91.1
Triggerfish	3,842	1.1	916	23.8
Sharks	3,817	1.1	413	10.8
Ribbonfish	3,407	1.0	3,288	96.5
Spade Fish (Okposansa)	2,326	0.7	2,287	98.3
Ray	1,533	0.4	1,475	96.2
Sardinella	1,398	0.4	1,288	92.1
Roncador	1,176	0.3	175	14.9
Shrimps	1,118	0.3	1,042	93.2
Butter Fish	1,060	0.3	985	93.0
Blue Marlin	952	0.3	212	22.2
Mullet	906	0.3	729	80.5
Garfish	881	0.3	805	91.3
Lobster	795	0.2	649	81.7
Soles	679	0.2	608	89.5
Red Pandora (Yiyiwa)	650	0.2	533	82.1
Moonfish	630	0.2	536	85.1
Decapterus (Pamplo)	578	0.2	499	86.3
Grouper	486	0.1	461	94.7
Kingfish (Saflo)	376	0.1	222	58.9
Atlantic sailfish	364	0.1	344	94.5
Burrito	360	0.1	295	81.9
Bonito	331	0.1	298	90.2
Threadfin	324	0.1	300	92.7
Others	302	0.1	298	98.5
Flying Fish	301	0.1	287	95.4
Drum	258	0.1	243	94.1
Seabream (Sikasika)	201	0.1	181	90.1
Crabs	178	0.1	53	29.7
Bigeye Fish	166	0.0	144	86.5
Flying Gurnard	148	0.0	57	38.2
Globefish	146	0.0	141	96.9
Dolphin Fish	138	0.0	132	95.7
Bumper	133	0.0	93	70.0
Snapper	102	0.0	93	90.8
Guitarfish	101	0.0	94	92.8
Palometa (Lilee)	99	0.0	96	96.9
Swordfish	93	0.0	88	94.5
Buro	82	0.0	7	8.0
Sea Snail	44	0.0	43	96.0
Ladyfish/Tenpounder	34	0.0	33	97.2
Halfbleak	26	0.0	26	99.4
Pampano (Kokobli)	3	0.0	3	96.1

Twelve of the marine species, with each constituting at least 1 percent of the total fish landed, accounted for 94.3 percent of total landing.

The most common type of fish landed from marine fishing is anchovy, accounting for 27.9 percent of all marine fish landed. The second most common is cassava fish (17.4%), followed by herrings (13.9%), see Figure 7.1

Figure 7.1 Twelve landed species with the highest share in marine fishing (percent)



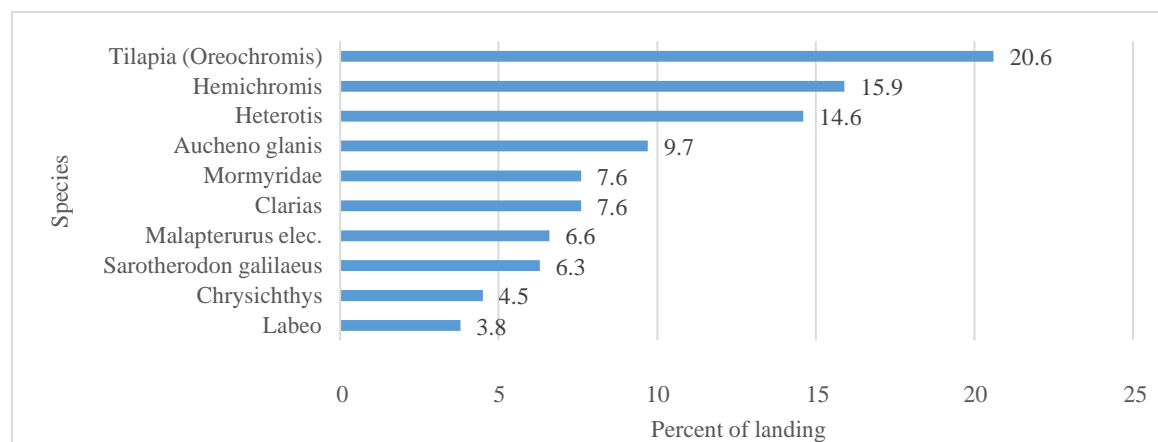
The five most common inland species landed, namely, tilapia (20.6%), hemichromis (15.9%), heterotis (14.6%), auchenoglanis (9.7%) and clarias (7.6%) constitute 68.4 percent of marine fishing. (Table 7.19).

Table 7.19: Quantity of inland fish (mts) by type of species, and by quantity landed and quantity sold

Species of fish	Quantity landed ((mts))		Quantity sold ((mts))	
	Number	%	Number	%
All species				
Total	430,454.90	100	270,534.60	62.8
Marine	343,282.60	79.7	199,678.60	58.2
Inland	87,172.20	20.3	70,856.00	81.3
Inland				
Total	87,172.20	100	70,856.00	81.3
Tilapia (Oreochromis)	17,994.40	20.6	16,564.30	92.1
Hemichromis	13,832.00	15.9	12,346.50	89.3
Heterotis	12,739.70	14.6	12,289.60	96.5
Auchenoglanis	8,496.90	9.7	8,023.50	94.4
Clarias	6,641.10	7.6	6,157.20	92.7
Mormyridae	6,619.20	7.6	761	11.5
Malapterurus elec.	5,768.30	6.6	5,358.80	92.9
Sarotherodon galilaeus	5,475.40	6.3	4,622.20	84.4
Chrysichthys	3,894.30	4.5	1,889.90	48.5
Labeo	3,272.90	3.8	933.6	28.5
Cynothrissa	527.1	0.6	417.6	79.2
Lates	429	0.5	306.2	71.4
Citharinus	328.5	0.4	287.6	87.5
Alestes	282.4	0.3	250.5	88.7
Distichodus	231.6	0.3	177.5	76.6
Bagrus	183.7	0.2	135.4	73.7
Hydrocynus	157.2	0.2	74.7	47.5
Brycinus nurse	119.7	0.1	99.4	83.1
Polypterus spp	73.7	0.1	65.1	88.4
Other	57.2	0.1	53.7	93.9
Gymnarchus	47.8	0.1	41.7	87.3

Ten of the inland species, each constituting at least one percent of the total fish landed, accounted for 97.2 percent of total landing. Tilapia has the highest proportion (20.6%), followed by hemichromis (15.9%) of inland fishing. See Figure 7.2.

Figure 7.2 Ten landed species with the highest share in inland fishing (percent)



The total value of inland fish landed was 87,172.20 Ghana cedis of which tilapia (20.6%), hemichromis (15.9%), heterotis (14.6%) and clarias (9.7%) contributed 60.8 percent to the value of landings in the inland capture. An estimated GHC 70,856.00 (81.3%) of the total value of fish landed was sold by holders (Table 7.20).

Table 7.20: Value of inland fish by type of species, and by landings and sale of inland fish by species

Species of fish	Value of quantity landed (GHC)		Quantity sold (GHC)	
	Number	%	Number	%
All species				
Total	430,454.90	100	270,534.60	62.8
Marine	343,282.60	79.7	199,678.60	58.2
Inland	87,172.20	20.3	70,856.00	81.3
Inland species				
Total	87,172.20	100	70,856.00	81.3
Hemichromis	13,832.00	15.9	12,346.50	89.3
Heterotis	12,739.70	14.6	12,289.60	96.5
Auchenoglanis	8,496.90	9.7	8,023.50	94.4
Clarias	6,641.10	7.6	6,157.20	92.7
Mormyridae	6,619.20	7.6	761	11.5
Malapterurus elec.	5,768.30	6.6	5,358.80	92.9
Sarotherodon galilaeus	5,475.40	6.3	4,622.20	84.4
Chrysichthys	3,894.30	4.5	1,889.90	48.5
Labeo	3,272.90	3.8	933.6	28.5
Cynothrissa	527.1	0.6	417.6	79.2
Lates	429	0.5	306.2	71.4
Citharinus	328.5	0.4	287.6	87.5
Alestes	282.4	0.3	250.5	88.7
Distichodus	231.6	0.3	177.5	76.6
Bagrus	183.7	0.2	135.4	73.7
Hydrocynus	157.2	0.2	74.7	47.5
Brycinus nurse	119.7	0.1	99.4	83.1
Polypterus spp	73.7	0.1	65.1	88.4
Other	57.2	0.1	53.7	93.9
Gymnarchus	47.8	0.1	41.7	87.3

The total value of marine fish was GHC 4,961,299,483 and constituted 87.2 percent of the total

value of fish landed while the value of sales was GH¢ 2,287,858,656, representing 46.1 percent

of total value of fish sold. The value of inland fish landed was 12.8 percent of total value of fish in terms of value of sales and constituted 72.4 percent of total value of sales Anchovy (46.6%) and herrings (14.7%) formed 61.3 percent of the total value of landings, (Table 7.21).

Table 7.21: Value of marine fish (GHC) by type of species, and by value landed and value sold

Species of fish	Value (GHC)		Value Sold	% of landing sold
	Value Landed	%		
Total	5,692,441,170	100	2,817,260,720	49.5
Inland	731,141,687	12.8	529,402,064	72.4
Marine	4,961,299,483	87.2	2,287,858,656	46.1
Marine species				
Total	4,961,299,483	100.0	2,287,858,656	46.1
Anchovy	2,313,194,999	46.6	560,391,711	24.2
Atlantic sailfish	2,196,924	0.0	2,077,600	94.6
Barracuda	6,863,141	0.1	6,278,304	91.5
Bigeye Fish	1,563,678	0.0	1,286,987	82.3
Blue Marlin	13,426,286	0.3	3,117,191	23.2
Bonito	2,161,258	0.0	1,949,486	90.2
Bumper	1,231,612	0.0	355,693	28.9
Buro	506,890	0.0	80,862	16.0
Burrito	6,418,407	0.1	5,555,975	86.6
Butter Fish	13,138,725	0.3	12,671,577	96.4
Cassava/Croaker	711,621,449	14.3	99,049,452	13.9
Crabs	1,277,555	0.0	802,995	62.9
Decapterus (Pamplo)	2,667,158	0.1	2,267,770	85.0
Dentex (Bala, Yeke, Tsile)	587,075,463	11.8	545,296,603	92.9
Dolphin Fish	1,208,390	0.0	1,169,533	96.8
Drum	3,508,610	0.1	3,315,776	94.5
Flying Fish	2,675,799	0.1	2,557,342	95.6
Flying Gurnard	1,661,336	0.0	903,027	54.4
Garfish	6,901,512	0.1	6,446,479	93.4
Globefish	747,481	0.0	726,272	97.2
Grouper	1,598,218	0.0	1,503,857	94.1
Guitarfish	3,690,737	0.1	3,462,384	93.8
Halfbleak	233,064	0.0	231,768	99.4
Kingfish (Saffo)	2,497,614	0.1	2,094,346	83.9
Ladyfish/Tenpounder	358,500	0.0	345,660	96.4
Lobster	12,599,501	0.3	9,333,135	74.1
Herring	731,267,095	14.7	612,512,868	83.8
Mackerel (Salmon)	71,457,997	1.4	66,457,969	93.0
Meagre	61,394,482	1.2	7,370,030	12.0
Moonfish	3,554,762	0.1	2,876,335	80.9
Mullet	11,699,376	0.2	8,391,822	71.7
Palometa (Lilee)	1,882,455	0.0	1,824,714	96.9
Pampano (Kokobli)	47,024	0.0	44,848	95.4
Ray	11,422,668	0.2	10,594,854	92.8
Red Pandora (Yiyiwa)	20,494,486	0.4	18,601,141	90.8
Ribbonfish	51,925,440	1.0	49,670,234	95.7
Roncador	18,955,225	0.4	1,774,046	9.4
Sardinella	18,758,697	0.4	17,454,502	93.0
Sea Snail	891,894	0.0	855,941	96.0
Seabream (Sikasika)	3,549,070	0.1	3,461,842	97.5
Shad/Bonga	18,211,253	0.4	12,767,098	70.1
Sharks	11,469,986	0.2	1,256,331	11.0
Shrimps	2,878,500	0.1	2,350,544	81.7
Snapper	487,690	0.0	470,345	96.4
Soles	4,444,429	0.1	3,319,389	74.7
Spade Fish (Okposansa)	18,056,440	0.4	17,765,816	98.4
Swordfish	1,282,832	0.0	1,180,440	92.0
Threadfin	2,758,019	0.1	2,606,956	94.5
Triggerfish	13,011,374	0.3	4,135,888	31.8
Tuna	179,751,536	3.6	166,230,525	92.5
Others	622,446.00	0.0	612,393	98.4

CHAPTER EIGHT

ARABLE CROPS

8.1 Introduction

In this chapter, information on holders and persons engaged in arable crop farming and its associated land tenure arrangements are discussed. In addition, information on the use of fertilizer, pesticides, protective cover and irrigation facilities by farmers is presented on 64 crops. These crops are classified into seven major categories, namely, starchy staples, pulses/legumes, herbs/spices, horticulture, leafy vegetables, non-leafy vegetables, and industrial crops.

8.2 Socio-demographic characteristics of arable crop holders

8.2.1 Sex and type of locality of holders

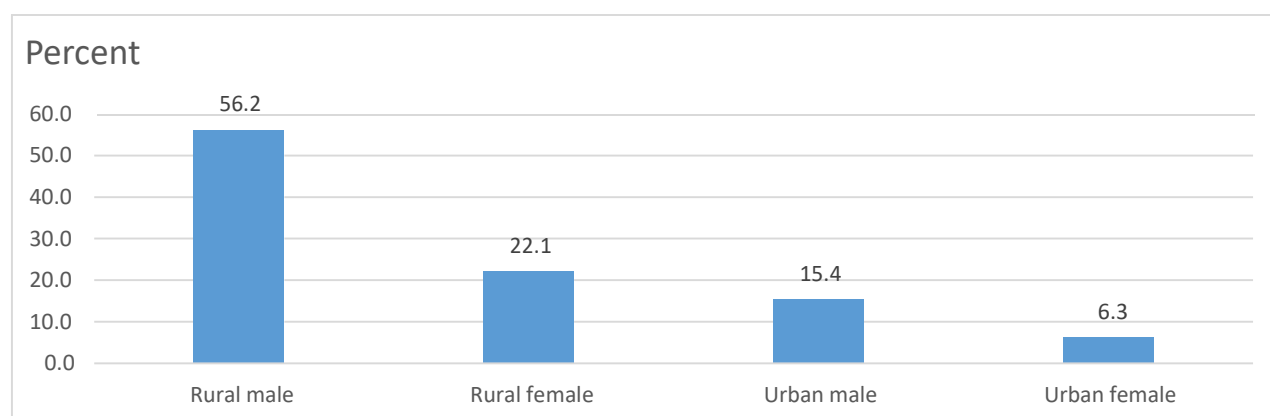
Arable crop cultivation is dominated by males in both rural and urban areas. Out of the total of 1,736,440 holders who cultivated one or more arable crops, 71.6 percent are males and 28.4 percent are females. There are minor differences in these proportions between urban areas and rural areas (Table 8.1).

Table 8.1: Arable crop holders 15 years or older by type of locality and sex

Type of locality	Sex of holder	Number	Percent
Total	Total	1,736,440	100.0
	Male	1,243,834	71.6
	Female	492,606	28.4
Urban	Total	376,374	100.0
	Male	267,598	71.1
	Female	108,776	28.9
Rural	Total	1,360,066	100.0
	Male	976,236	71.8
	Female	383,830	28.2

Majority of arable crop holders (56.2%) are males residing in the rural areas while females residing in the urban areas are in the minority with a share of 6.3 percent (Figure 8.1).

Figure 8.1 Distribution of arable crop holders 15 years or older by type of locality and sex



Most arable crop holders in urban as well as rural areas are into starchy staple crops. The proportion of starchy staple crop holders among holders cultivating arable crops is 79.4 percent, 80.3 percent for male holders and 76.7 percent for female holders. The next commonly cultivated type of arable crop is pulses/legumes (11.9%). The proportion of pulses/legumes holders in the rural areas (13.0%) is about twice the proportion in urban areas (7.4%) and this is equally true for males as well as for females. The proportion of holders of the other types of arable crop together constitute 8.7 percent of holders with the proportion of females (10.8%) being higher than that of males (8.0%), see Table 8.2.

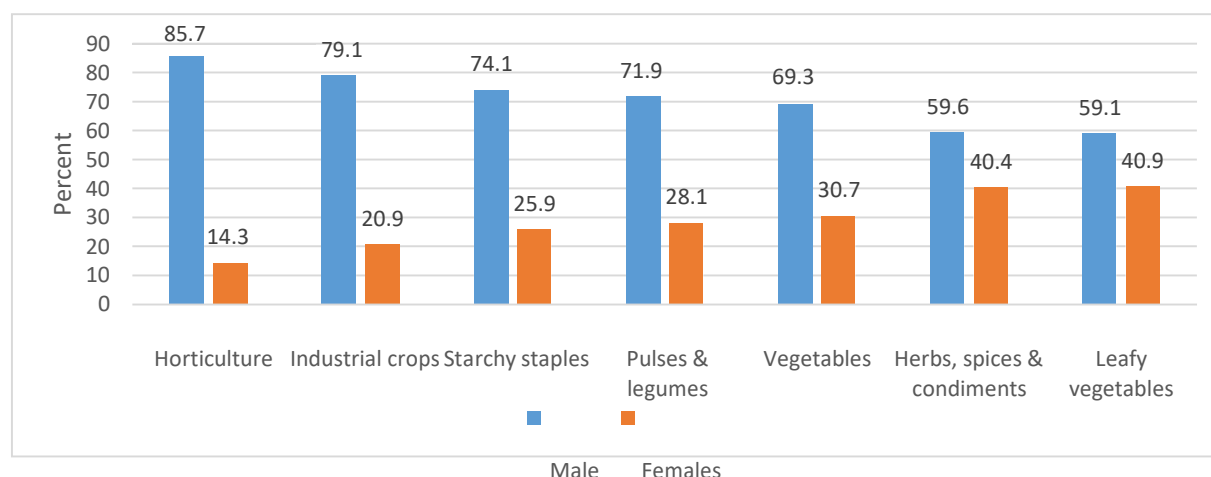
Table 8.2: Arable crop holders 15 years or older by type of arable crop*, and by type of locality and sex

Types of arable crops	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total	542,913	226,666	769,579	2,294,196	813,003	3,107,199	2,837,109	1,039,669	3,876,778
Starchy staples	446,517	189,217	635,734	1,832,577	608,291	2,440,868	2,279,094	797,508	3,076,602
Pulses and legumes	41,415	15,313	56,728	289,756	114,197	403,953	331,171	129,510	460,681
Herbs/spices/condiments	14,205	9,188	23,393	56,461	38,703	95,164	70,666	47,891	118,557
Horticulture	2,626	456	3,082	9,773	1,618	11,391	12,399	2,074	14,473
Leafy vegetables	855	574	1,429	1,632	1,145	2,777	2,487	1,719	4,206
Non-leafy vegetables	35,814	11,449	47,263	96,124	47,047	143,171	131,938	58,496	190,434
Industrial crops	1,481	469	1,950	7,873	2,002	9,875	9,354	2,471	11,825
Percentage distribution									
Total	100	100	100	100	100	100	100	100	100
Starchy staples	82.2	83.5	82.6	79.9	74.8	78.6	80.3	76.7	79.4
Pulses and legumes	7.6	6.8	7.4	12.6	14	13	11.7	12.5	11.9
Herbs/spices/condiments	2.6	4.1	3	2.5	4.8	3.1	2.5	4.6	3.1
Horticulture	0.5	0.2	0.4	0.4	0.2	0.4	0.4	0.2	0.4
Leafy vegetables	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1
Non-leafy vegetables	6.6	5.1	6.1	4.2	5.8	4.6	4.7	5.6	4.9
Industrial crops	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3

*A holder may be engaged in more than one agriculture activity.

Male holders predominate in the cultivation of arable crops, constituting more than two-thirds of holders in all types of arable crops, except in the cultivation of leafy vegetables (59.6%) and spices/condiments (59.1%), see Figure 8.2.

Figure 8.2: Type of arable crops holders are cultivating by sex (percent)



8.2.2 Age and type of locality of holders

The age structure of arable crop holders is similar across the seven types of crops. Age groups below 30 years, hold less than 10 percent of arable crops with the 20-24 years age group holding 2.3 percent and the 25-30 years age group holding 7.1 percent.

About 76 percent of arable crop holders are 36 years or older of which the majority are in the 36-59 years age group. The proportions are similar for all types of arable crops either in the urban or rural areas. The number of holders increases with age up to 59 years. Arable crop holders are mostly males, with male numbers being 2.5 times higher (1,243,834) than the number of females (492,606). The proportion of females 60 years or older is higher than males for each type of crop in both urban and rural areas (Table 8.3).

Table 8.3: Arable crop holders 15 years or older by age and sex, and by type of arable crop and type of locality

Age group	Leafy Non-leafy																
	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		vegetables		vegetables		Industrial crops		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both																	
Sexes	635,734	2,440,868	56,728	403,953	23,393	95,164	3,082	11,391	1,429	2,777	47,263	143,171	1,950	9,875	376,374	1,360,066	1,736,440
15-19	0.1	0.3	0.4	0.6	0.2	0.5	0.1	0.2	0.1	0.5	0.2	0.4	0.0	0.3	0.2	0.4	0.4
20-24	1.2	2.0	2.1	3.2	1.9	3.1	1.3	2.5	1.0	2.4	1.8	2.7	0.9	2.2	1.4	2.5	2.3
25-29	5.2	6.6	7.5	8.6	7.2	8.3	6.3	8.0	4.7	7.4	7.0	8.2	3.1	6.3	6.0	7.4	7.1
30-35	13.5	14.7	16.9	16.6	15.5	16.8	15.5	17.4	14.2	13.3	16.7	16.9	9.6	13.2	15.2	15.9	15.8
36-59	60.5	57.5	58.9	55.0	59.7	56.2	61.4	57.4	61.0	57.1	61.9	58.0	61.1	56.2	59.9	56.2	57.0
60+	19.4	18.8	14.3	16.0	15.6	15.1	15.4	14.5	19.1	19.3	12.5	13.8	25.2	21.9	17.3	17.5	17.5
Male	446,517	1,832,577	41,415	289,756	14,205	56,461	2,626	9,773	855	1,632	35,814	96,124	1,481	7,873	267,598	976,236	1,243,834
15-19	0.2	0.4	0.4	0.6	0.2	0.4	0.1	0.2	0.1	0.7	0.2	0.4	0.0	0.4	0.2	0.5	0.4
20-24	1.3	2.2	1.9	3.0	1.9	2.6	1.2	2.6	1.1	2.6	1.9	2.4	0.8	2.5	1.6	2.6	2.4
25-29	5.8	7.4	7.5	8.8	7.3	8.2	6.7	8.5	5.0	8.4	7.4	8.4	3.6	6.9	6.5	8.0	7.7
30-35	14.8	15.9	17.3	17.0	16.5	17.2	16.1	17.9	15.1	14.8	17.7	17.3	9.7	14.0	16.3	16.9	16.8
36-59	60.9	57.3	59.4	54.9	60.5	57.8	61.3	57.5	61.2	56.7	62.0	59.1	61.8	55.6	60.1	56.3	57.1
60+	17.0	16.7	13.4	15.5	13.7	13.7	14.5	13.3	17.5	16.9	10.9	12.5	24.1	20.6	15.2	15.7	15.6
Female	189,217	608,291	15,313	114,197	9,188	38,703	456	1,618	574	1,145	11,449	47,047	469	2,002	108,776	383,830	492,606
15-19	0.1	0.2	0.4	0.6	0.1	0.6	0.0	0.0	0.0	0.2	0.2	0.5	0.0	0.0	0.1	0.4	0.3
20-24	0.8	1.3	2.4	3.6	1.9	3.9	1.8	1.7	0.9	2.1	1.5	3.3	1.3	1.0	1.1	2.2	1.9
25-29	3.8	4.3	7.3	7.9	7.0	8.4	3.7	4.9	4.2	6.0	5.8	7.8	1.7	3.8	4.7	5.7	5.5
30-35	10.6	11.1	16.0	15.4	14.0	16.1	11.8	14.7	12.9	11.1	13.7	16.0	9.4	9.7	12.4	13.5	13.2
36-59	59.7	58.0	57.5	55.2	58.4	53.8	62.1	56.9	60.6	57.8	61.3	55.7	59.1	58.3	59.2	56.1	56.8
60+	25.1	25.2	16.4	17.3	18.5	17.1	20.6	21.9	21.4	22.8	17.5	16.6	28.6	27.1	22.4	22.2	22.2

8.2.3 Youth holders and type of locality

The total of youth holders engaged in starchy staples is 705,096 of which 577,553 are in rural areas. Most youth holders engaged in arable crops are persons older than 24 years with more than twice the number in the age group of 30-35 years than the number in the age group of 25-29 years. Youth holders engaged in arable crop constitute at least one-fifth of all arable crop holders with higher proportions among those in urban areas than in rural areas.

More than three-quarters of arable crop youth holders are males except for those in urban areas engaged in herbs/spices and leafy vegetables, as well as those in rural areas engaged in herbs/spices, leafy vegetables and non-leafy vegetables, where the proportion of youth males are less than three-quarters (Table 8.4).

Table 8.4: Arable crop holders 15-35 years (youth) by age and sex, and by type of arable crop and type of locality

Age group	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		Leafy vegetables		Non-leafy vegetables		Industrial crops	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both Sexes 15+	635,734	2,440,868	56,728	403,953	23,393	95,164	3,082	11,391	1,429	2,777	47,263	143,171	1,950	9,875
Both Sexes	127,543	577,553	15,227	117,101	5,795	27,306	714	3,194	285	654	12,121	40,385	267	2,165
15-19	820	7,450	207	2,584	36	486	3	23	1	13	79	605	0	30
20-24	7,477	49,073	1,167	12,902	450	2,977	39	280	14	66	838	3,899	18	215
25-29	33,230	162,079	4,244	34,575	1,681	7,890	194	907	67	206	3,308	11,719	61	621
30-35	86,016	358,951	9,609	67,040	3,628	15,953	478	1,984	203	369	7,896	24,162	188	1,299
Youth														
15-24	8,297	56,523	1,374	15,486	486	3,463	42	303	15	79	917	4,504	18	245
15-35	127,543	577,553	15,227	117,101	5,795	27,306	714	3,194	285	654	12,121	40,385	267	2,165
Male	98,734	475,045	11,238	85,675	3,675	16,067	635	2,850	182	432	9,697	27,343	209	1,873
15-19	687	6,416	151	1,843	25	251	3	23	1	11	56	353	0	29
20-24	5,959	41,107	798	8,829	272	1,478	31	253	9	42	668	2,348	12	194
25-29	26,044	136,125	3,124	25,601	1,040	4,630	177	828	43	137	2,644	8,030	53	545
30-35	66,044	291,397	7,165	49,402	2,338	9,708	424	1,746	129	242	6,329	16,612	144	1,105
Youth														
15-24	6,646	47,523	949	10,672	297	1,729	34	276	10	53	724	2,701	12	223
15-35	98,734	475,045	11,238	85,675	3,675	16,067	635	2,850	182	432	9,697	27,343	209	1,873
Female	28,809	102,508	3,989	31,426	2,120	11,239	79	344	103	222	2,424	13,042	58	292
15-19	133	1,034	56	741	11	235	0	0	0	2	23	252	0	1
20-24	1,518	7,966	369	4,073	178	1,499	8	27	5	24	170	1,551	6	21
25-29	7,186	25,954	1,120	8,974	641	3,260	17	79	24	69	664	3,689	8	76
30-35	19,972	67,554	2,444	17,638	1,290	6,245	54	238	74	127	1,567	7,550	44	194
Youth														
15-24	1,651	9,000	425	4,814	189	1,734	8	27	5	26	193	1,803	6	22
15-35	28,809	102,508	3,989	31,426	2,120	11,239	79	344	103	222	2,424	13,042	58	292
Percent of population														
15-24	1.3	2.3	2.4	3.8	2.1	3.6	1.4	2.7	1	2.8	1.9	3.1	0.9	2.5
15-35	20.1	23.7	26.8	29	24.8	28.7	23.2	28	19.9	23.6	25.6	28.2	13.7	21.9
Sex composition														
Youth 15-24	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male	80.1	84.1	69.1	68.9	61.1	49.9	81.0	91.1	66.7	67.1	79.0	60.0	66.7	91.0
Female	19.9	15.9	30.9	31.1	38.9	50.1	19.0	8.9	33.3	32.9	21.0	40.0	33.3	9.0
Youth 15-35	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male	77.4	82.3	73.8	73.2	63.4	58.8	88.9	89.2	63.9	66.1	80.0	67.7	78.3	86.5
Female	22.6	17.7	26.2	26.8	36.6	41.2	11.1	10.8	36.1	33.9	20.0	32.3	21.7	13.5

8.2.4 *Educational attainment and literacy status of holders*

About 75.2 percent of arable crop holders have either never attended (51.0%) or have attained basic education (24.2%). The proportion of those who have never attended school is higher in urban (52.1%) than in rural (50.7%) areas but higher in rural (25.9%) than in urban (17.0%) areas for those who have attained basic education.

The proportion of those who have attained secondary/vocational education is less than one-fifth for holders who cultivate leafy vegetables and pulses/legumes while the proportion of responses for all other types of arable crops is at least one-fifth with the proportion close to one-third for holders cultivating horticultural crops and non-leafy vegetables.

The proportion of those who have attained secondary or higher education is higher in urban than in rural areas for all types of arable crops than for those into horticultural crops. For each type of locality, the proportions of those who have attained secondary or higher level of education are higher for males than females with much wider differences among holders who have attained tertiary level of education for all types of arable crops (Table 8.5).

Table 8.5: Arable crop holders 15 years or older by educational attainment and sex, and by type of arable crop and type of locality

Educational attainment/ Sex of holder									Leafy		Non-leafy				Total Responses		
	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		vegetables		vegetables		Industrial crops				
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Total	1,220,911	4,818,005	108,883	796,894	45,228	188,209	5,797	22,392	2,552	5,434	90,374	282,581	3,721	19,492	1,477,466	6,133,007	7,610,473
Never attended	52.1	50.7	52.1	50.7	51.7	50.6	53.2	50.9	56.0	51.1	52.3	50.7	52.4	50.7	52.1	50.7	51.0
Basic education	16.4	24.5	29.4	37.6	15.6	22.3	8.3	15.3	13.8	27.2	11.4	20.4	12.3	22.6	17.0	25.9	24.2
Sec./vocational	25.1	21.5	13.6	9.1	25.7	23.4	27.5	28.3	19.4	17.8	27.5	24.7	27.5	23.1	24.4	20.1	21.0
Post-secondary																	
Diploma	5.9	3.1	4.6	2.5	6.6	3.5	10.2	5.2	8.9	3.6	8.3	4.0	7.0	3.4	6.0	3.1	3.7
Tertiary	0.5	0.2	0.3	0.1	0.4	0.2	0.8	0.3	1.9	0.3	0.5	0.2	0.8	0.2	0.5	0.2	0.2
Male																	
Total	446,517	1,832,577	41,414	289,756	14,204	56,461	2,626	9,773	856	1,631	35,814	96,124	1,482	7,872	542,913	2,294,194	2,837,107
Never attended	29.0	47.2	54.3	70.5	20.2	31.4	13.9	27.7	17.8	46.1	16.7	30.1	16.6	41.8	29.8	48.9	45.3
Basic education	46.2	41.7	24.3	19.5	52.6	54.9	51.5	56.7	36.8	38.1	54.0	55.3	57.1	46.9	45.3	39.9	40.9
Sec./vocational	13.5	7.4	10.4	6.3	16.7	9.9	20.3	11.2	17.4	9.7	18.1	10.4	14.9	7.8	13.7	7.5	8.7
Post-secondary																	
Diploma	1.2	0.5	0.8	0.4	1.1	0.5	1.4	0.6	3.0	0.8	1.2	0.6	1.6	0.4	1.2	0.5	0.6
Tertiary	10.1	3.2	10.2	3.3	9.4	3.3	12.9	3.8	25.0	5.3	10.0	3.6	9.8	3.1	10.1	3.2	4.6
Female																	
Total	189,217	608,293	15,314	114,198	9,190	38,704	457	1,619	575	1,146	11,451	47,048	470	2,001	226,674	813,009	1,039,683
Never attended	37.5	51.8	62.0	83.8	45.7	62.7	26.0	44.5	34.8	63.2	38.3	61.0	45.3	55.7	39.5	57.4	53.5
Basic education	53.0	44.4	30.9	14.0	45.0	33.9	53.6	49.4	31.8	30.5	48.0	35.2	37.7	40.9	50.8	39.1	41.6
Sec./vocational	6.2	2.7	4.5	1.6	6.5	2.7	12.9	4.8	13.6	3.4	8.8	3.0	8.9	2.5	6.3	2.6	3.4
Post-secondary																	
Diploma	0.5	0.2	0.3	0.1	0.3	0.1	1.3	0.4	3.8	0.1	0.6	0.1	0.9	0.2	0.5	0.2	0.2
Tertiary	2.8	0.9	2.3	0.5	2.5	0.6	6.1	0.9	16.0	2.9	4.3	0.7	7.2	0.7	2.9	0.8	1.3

Literacy status of holders

For each type of arable crop cultivation in urban areas, more than half are literate in at least one language, except for those engaged in pulses/legumes, with holders cultivating horticultural having the highest (77.7%). In the case of rural areas, more than half of the holders engaged in herbs/spices, horticultural crops, non-leafy vegetables and industrial crops are literate in at least one language.

The proportion of arable crop holders who are literate in English and a Ghanaian language constitutes the highest among the languages. About half of horticultural crop holders (50.8%) in the urban areas are literate in English and a Ghanaian language, while only about 10 percent of pulses/legumes holders in the rural areas are literate in English with a Ghanaian language. A similar pattern is observed for males and females where the proportion literate in English and a Ghanaian language is the highest.

With the exception of male holders engaged in pulses/legumes, more than half of the male holders in arable crop with higher proportion in urban areas are literate. For female holders, those in urban areas and are engaged in horticultural and leafy vegetables constitute the highest proportion of literates (65.0%), See Table 8.6.

Table 8.6: Arable crop holders 15 years or older by literacy status, language and sex, and by type of arable crop and type of locality

Literacy and sex	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		Leafy vegetables		Non-leafy vegetables		Industrial crops	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both Sexes	635,734	2,440,868	56,728	403,953	23,393	95,164	3,082	11,391	1,429	2,777	47,263	143,171	1,950	9,875
None (not literate)	38.1	52.2	56.0	69.4	39.3	48.5	22.3	31.0	26.5	54.2	30.4	45.6	31.1	49.5
Literate	61.9	47.8	44.0	30.6	60.7	51.5	77.7	69.0	73.5	45.8	69.6	54.4	68.9	50.5
Literate														
English only	8.7	6.6	10.0	6.7	9.8	7.1	14.1	8.4	13.9	5.5	10.2	7.3	14.6	7.3
Ghanaian lang. only	15.6	16.9	12.3	12.9	13.9	16.3	12.1	19.6	13.4	15.0	13.9	16.8	11.1	14.1
Engl. and Gh'ian lang.	36.7	23.4	20.6	10.2	36.0	26.8	50.8	40.4	45.2	22.4	44.3	29.3	42.2	28.6
English and French	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.0
Engl, Frch. & Gh'ian lang.	0.2	0.1	0.1	0.0	0.3	0.1	0.3	0.2	0.3	0.4	0.3	0.1	0.5	0.1
Other languages	0.6	0.8	0.9	0.8	0.6	1.1	0.2	0.3	0.4	2.4	0.8	0.8	0.4	0.4
Male														
Total	446,517	1,832,577	41,415	289,756	14,205	56,461	2,626	9,773	855	1,632	35,814	96,124	1,481	7,873
None (not literate)	33.2	49.8	52.8	66.0	28.0	37.2	20.1	28.5	21.1	49.6	24.5	36.5	23.4	47.1
Literate	66.8	50.2	47.2	34.0	72.0	62.8	79.9	71.5	78.9	50.4	75.5	63.5	76.6	52.9
Literate														
English only	10.3	7.6	11.5	8.0	12.2	9.0	14.4	9.0	14.4	6.9	11.1	8.8	17.4	8.2
Ghanaian lang. only	13.4	15.7	11.0	12.9	12.0	16.1	10.8	18.7	10.3	12.1	13.0	16.6	11.4	12.4
Engl. and Gh'ian lang.	42.2	25.9	23.5	12.4	46.6	36.4	54.0	43.2	52.7	28.3	50.0	37.0	46.6	31.8
English and French	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.1	0.0
Engl, Frch. & Gh'ian lang.	0.2	0.1	0.1	0.0	0.4	0.2	0.3	0.2	0.4	0.4	0.4	0.1	0.6	0.1
Other languages	0.6	0.8	1.0	0.7	0.7	1.0	0.2	0.3	0.7	2.6	0.9	0.9	0.5	0.4
Female														
Total	189,217	608,291	15,313	114,197	9,188	38,703	456	1,618	574	1,145	11,449	47,047	469	2,002
None (not literate)	49.5	59.6	64.7	78.0	56.7	65.0	34.6	46.1	34.5	60.9	48.9	64.3	55.2	59.0
Literate	50.5	40.4	35.3	22.0	43.3	35.0	65.4	53.9	65.5	39.1	51.1	35.7	44.8	41.0
Literate														
English only	4.9	3.7	6.0	3.3	5.9	4.2	12.5	4.8	13.1	3.5	7.3	4.2	6.0	3.6
Ghanaian lang. only	20.9	20.8	15.9	13.0	16.9	16.6	19.7	25.3	18.1	19.2	17.0	17.3	10.0	20.8
Engl. and Gh'ian lang.	24.1	15.1	12.6	4.9	20.0	12.9	32.8	23.3	33.9	14.0	25.8	13.5	28.6	16.2
English and French	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0
Engl, Frch. & Gh'ian lang.	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.0	0.0	0.0
Other languages	0.5	0.8	0.7	0.8	0.4	1.3	0.2	0.3	0.0	2.0	0.7	0.6	0.2	0.4

8.2.5 *Nationality of holders*

Almost all holders (99.7%) cultivating arable crops are Ghanaian. The proportion of non-Ghanaian holders is higher than the average (0.3%) among holders in the rural areas who cultivate leafy vegetables (0.6%) and horticulture (0.4%) while for holders in urban areas the proportion of non-Ghanaians is higher among those who cultivate industrial crops (0.5%).

At least half of the non-Ghanaian holders in both urban and rural areas cultivating each type of arable crops are Togolese, except in the cultivation of non-leafy vegetables, horticultural crops, industrial crops and leafy vegetables in urban areas and the cultivation of industrial crops where the proportion of Togolese holdings is less than 50 percent in rural areas (Table 8.7).

8.2.6 *Disability status of holders*

The proportion of arable crop holders who have some form of disability is 1.1 percent, same in the rural areas but slightly lower in urban areas with a similar pattern observed for males and females. The proportion of female holders who have some form of disability is higher (1.3%) than males (1.0%) and for all types of arable crops (Table 8.8).

Table 8.7: Arable crop holders 15 years or older by nationality, and by type of arable crop and type of locality

Nationality	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		Leafy vegetables		Non-leafy vegetables		Industrial crops		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Total	635,734	2,440,868	56,728	403,953	23,393	95,164	3,082	11,391	1,429	2,777	47,263	143,171	1,950	9,875	376,374	1,360,066	1,736,440
Ghanaian	99.8	99.7	99.8	99.8	99.7	99.7	99.8	99.6	98.3	99.4	99.7	99.7	99.5	99.7	99.7	99.7	99.7
Non-Ghanaian	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.4	1.7	0.6	0.3	0.3	0.5	0.3	0.3	0.3	0.3
Non-Ghanaian	1,478	6,701	112	748	64	303	7	49	25	18	119	447	10	29	978	4,227	5,205
<i>Burkinabe</i>	13.1	18.8	17.0	20.5	3.1	5.9	14.3	4.1	8.0	0.0	11.8	11.0	30.0	34.5	13.7	21.8	20.3
<i>Ivoirian</i>	7.2	6.1	6.3	1.5	10.9	3.6	0.0	4.1	4.0	0.0	15.1	6.5	0.0	3.4	7.1	5.5	5.8
<i>Nigerian</i>	4.5	2.9	4.5	0.9	4.7	2.6	14.3	4.1	20.0	22.2	10.9	3.6	0.0	6.9	5.4	3.1	3.6
<i>Togolese</i>	51.8	53.3	51.8	58.7	56.3	68.6	28.6	71.4	12.0	66.7	44.5	59.5	20.0	13.8	47.9	50.0	49.6
<i>Other African</i>	22.5	18.8	19.6	18.2	21.9	18.8	28.6	14.3	40.0	5.6	13.4	18.1	40.0	41.4	24.6	19.3	20.3
<i>Non-African</i>	0.9	0.1	0.9	0.3	3.1	0.3	14.3	2.0	16.0	5.6	4.2	1.3	10.0	0.0	1.3	0.3	0.5

Table 8.8: Arable crop holders 15 years or older by disability status and sex, and by type of arable crop and type of locality

Disability status	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		Leafy vegetables		Non-leafy vegetables		Industrial crops		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both sexes																	
Total	635,734	2,440,868	56,728	403,953	23,393	95,164	3,082	11,391	1,429	2,777	47,263	143,171	1,950	9,875	376,374	1,360,066	1,736,440
Without Disability	99.1	98.9	99.4	98.8	99.2	99.1	99.3	99.2	99.4	98.4	99.3	99.1	98.1	98.8	99.2	98.9	98.9
With Disability	0.9	1.1	0.6	1.2	0.8	0.9	0.7	0.8	0.6	1.6	0.7	0.9	1.9	1.2	0.8	1.1	1.1
Male																	
Total	446,517	1,832,577	41,415	289,756	14,205	56,461	2,626	9,773	855	1,632	35,814	96,124	1,481	7,873	267,598	976,236	1,243,834
Without Disability	99.2	99.0	99.5	98.9	99.3	99.1	99.4	99.3	99.5	98.5	99.4	99.2	98.2	98.9	99.3	99.0	99.0
With Disability	0.8	1.0	0.5	1.1	0.7	0.9	0.6	0.7	0.5	1.5	0.6	0.8	1.8	1.1	0.7	1.0	1.0
Female																	
Total	189,217	608,291	15,313	114,197	9,188	38,703	456	1,618	574	1,145	11,449	47,047	469	2,002	108,776	383,830	492,606
Without Disability	98.9	98.7	99.2	98.5	99.2	99.0	98.9	98.6	99.1	98.3	98.9	99.0	97.9	98.4	98.9	98.6	98.7
With Disability	1.1	1.3	0.8	1.5	0.8	1.0	1.1	1.4	0.9	1.7	1.1	1.0	2.1	1.6	1.1	1.4	1.3

Types of disability of arable crop holders

Among arable crop holders, there are no discernable patterns in the prevalence of the different types of disability across urban and rural areas. While 66.7 percent of holders engaged in leafy vegetables in urban areas are physically challenged relative to 37.5 percent for rural, those with sight difficulties are more prevalent in rural areas (39.3%) compared to urban areas (22.2%). This is true for males and females (Table 8.9).

Table 8.9: Arable crop holders 15 years or older by type of disability and sex, and by type of arable crop and type of locality

Type of disability	Starchy staples		Pulses/legumes		Herbs/spices		Horticulture		Leafy vegetables		Non-leafy vegetables		Industrial crops	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both sexes														
Total responses*	8,732	38,461	537	7,026	296	1,322	31	106	9	56	519	1,861	65	158
Sight	27.7	27.9	28.1	25.8	25.7	31.8	25.8	33.0	22.2	39.3	26.2	30.7	26.2	27.8
Hearing	17.2	16.8	17.5	17.1	17.6	16.6	19.4	13.2	0.0	19.6	15.0	15.7	15.4	16.5
Speech	13.6	13.5	14.7	12.0	15.5	14.2	9.7	11.3	11.1	3.6	14.6	15.0	13.8	11.4
Physical	41.5	41.8	39.7	45.1	41.2	37.3	45.2	42.5	66.7	37.5	44.1	38.6	44.6	44.3
Male														
Total responses	5,605	27,291	351	4,529	164	788	19	82	4	31	329	1,178	52	118
Sight	27.8	28.3	27.9	27.1	25.6	30.5	26.3	32.9	25.0	45.2	26.1	31.2	25.0	25.4
Hearing	17.5	17.0	17.9	17.0	17.1	15.9	15.8	13.4	0.0	22.6	14.9	15.7	17.3	19.5
Speech	14.7	14.2	14.0	12.4	15.2	16.9	5.3	11.0	0.0	3.2	14.6	15.8	15.4	13.6
Physical	40.0	40.6	40.2	43.5	42.1	36.8	52.6	42.7	75.0	29.0	44.4	37.3	42.3	41.5
Female														
Total responses	3,127	11,170	186	2,497	132	534	12	24	5	25	190	683	13	40
Sight	27.4	27.2	28.5	23.5	25.8	33.9	25.0	33.3	20.0	32.0	26.3	29.7	30.8	35.0
Hearing	16.6	16.2	16.7	17.1	18.2	17.8	25.0	12.5	0.0	16.0	15.3	15.7	7.7	7.5
Speech	11.7	11.8	16.1	11.4	15.9	10.3	16.7	12.5	20.0	4.0	14.7	13.6	7.7	5.0
Physical	44.3	44.8	38.7	48.0	40.2	38.0	33.3	41.7	60.0	48.0	43.7	41.0	53.8	52.5

*A person could have more than one form of disability.

8.3 Cropping systems

Mixed-cropping is a common practice in the cultivation of arable crops. Majority of holders cultivating arable crops (58.7%) are practicing mixed-cropping compared to the 41.3 percent practicing mono-cropping.

More than half of the holders engaged in the cultivation of leafy vegetables

Two types of cropping systems are practiced by holders; mono-cropping and mixed-cropping.

Mono-cropping is the system where only one type of crop is cultivated on a parcel.

Mixed-cropping is the system of cultivating two or more crops together on the same parcel.

(70.2%), starchy staples (61.9%) and non-leafy vegetables (53.0%) practice mixed-cropping, while those cultivating industrial crops (72.7%), horticultural crops (72.5%), pulses/legumes (56.4%) and herbs/spices/condiments (50.6%) largely practice mono-cropping (Table 8.10).

The table further shows that a higher proportion of females (65.9%) than males (56.1%) practice mixed-cropping. The opposite is true for mono-cropping (males, 43.9%; females, 34.1%). About three-quarters of males cultivating leafy vegetables are practicing mixed-cropping while most males cultivating industrial (75.0%) and horticultural crops (74.0%) are practicing mono-cropping. More than two-thirds of females who cultivate leafy vegetables and starchy staples practice mixed-cropping while the practice of mono-cropping among females

is more common with holders who grow industrial (64.1%) and horticultural (63.7%) crops.

Mixed-cropping is prevalent in rural areas as 80.1 percent (1,823,755) of holders practicing mixed-cropping are in the rural areas with about 90 percent of them growing pulse and legume crops. In the urban areas, the highest proportion of holders who practice mixed-cropping is 30.7 percent. A similar pattern is observed for holders practicing mono-cropping and for both males and females (Table 8.10).

Table 8.10: Arable crop holders 15 years or older by type of arable crop and sex, and by type of cropping system and type of locality

Type of crop	Mono-cropping			Mixed-cropping			All holders		
	Urban	Rural	Total	Urban	Rural	Total	Mono	Mixed	Total
Both sexes	317,906	1,283,444	1,601,350	451,673	1,823,755	2,275,428	41.3	58.7	3,876,778
Starchy staples	20.7	79.3	1,171,892	20.7	79.3	1,904,710	38.1	61.9	3,076,602
Pulses and legumes	14.0	86.0	259,637	10.1	89.9	201,044	56.4	43.6	460,681
Spices / condiments	19.3	80.7	59,985	20.2	79.8	58,572	50.6	49.4	118,557
Horticulture	21.1	78.9	10,493	21.9	78.1	3,980	72.5	27.5	14,473
Leafy vegetables	41.6	58.4	1,254	30.7	69.3	2,952	29.8	70.2	4,206
Non-leafy vegetables	26.5	73.5	89,493	23.3	76.7	100,941	47.0	53.0	190,434
Industrial crops	13.3	86.7	8,596	25.1	74.9	3,229	72.7	27.3	11,825
Male	247,110	999,783	1,246,893	295,803	1,294,413	1,590,216			
Total	19.8	80.2	1,246,893	18.6	81.4	1,590,216	43.9	56.1	2,837,109
Starchy staples	20.3	79.7	935,697	19.1	80.9	1,343,397	41.1	58.9	2,279,094
Pulses and legumes	14.4	85.6	189,020	9.9	90.1	142,151	57.1	42.9	331,171
Spices / condiments	18.9	81.1	37,102	21.5	78.5	33,564	52.5	47.5	70,666
Horticulture	21.2	78.8	9,172	21.2	78.8	3,227	74.0	26.0	12,399
Leafy vegetables	43.3	56.7	808	30.1	69.9	1,679	32.5	67.5	2,487
Non-leafy vegetables	28.4	71.6	68,082	25.8	74.2	63,856	51.6	48.4	131,938
Industrial crops	13.5	86.5	8,596	23.0	77.0	3,229	75.0	25.0	11,825
Female	70,796	283,661	354,457	155,870	529,342	685,212			
Total	20.0	80.0	354,457	22.7	77.3	685,212	34.1	65.9	1,039,669
Starchy staples	22.0	78.0	236,195	24.4	75.6	561,313	29.6	70.4	797,508
Pulses and legumes	13.0	87.0	70,617	10.5	89.5	58,893	54.5	45.5	129,510
Spices / condiments	19.9	80.1	22,883	18.5	81.5	25,008	47.8	52.2	47,891
Horticulture	20.1	79.9	1,321	25.2	74.8	753	63.7	36.3	2,074
Leafy vegetables	38.6	61.4	446	31.6	68.4	1,273	25.9	74.1	1,719
Non-leafy vegetables	20.6	79.4	21,411	19.0	81.0	37,085	36.6	63.4	58,496
Industrial crops	12.5	87.5	8,596	30.7	69.3	3,229	64.1	35.9	11,825

*A person could be a holder of more than one arable crop.

Most cultivated arable crops

Holders cultivating maize (27.3%), cassava (18.9%) and plantain (10.8%) constitute 57.0 percent of all arable crop holders. The proportion of male holders who cultivate maize (29.0%) is higher than that of females (22.7%). For the cultivation of cassava and plantain, the proportions of females (23.4%, 14.2%) are higher than that of males (17.2%, 9.6% respectively). A similar pattern is observed among these three crops for male or female holders in the urban and rural areas (Table 8.11).

Furthermore, the proportions of male holders cultivating yam (8.5%), millet (5.6%) and sorghum (2.6%) are twice as high as that of female holders (3.5%, 2.7% and 1.2% respectively). In contrast, the proportion of female holders cultivating hot pepper (4.2%) and okra (2.6%) are twice as high as that of male holders (2.1% and 1.3% respectively).

Table 8.11: Arable crop holders 15 years or older by top 25 most cultivated crops, and by type of locality and sex

Arable crops	Total				Urban				Rural			
	Male	Female	Total	N	Male	Female	Total	N	Male	Female	Total	N
	%	%			%	%			%	%		
All arable crops	2,837,109	1,039,669	3,876,778		542,913	226,666	769,579		2,294,196	813,003	3,107,199	
Maize	29.0	22.7	27.3	1,058,881	31.1	22.5	28.5	219,580	28.5	22.7	27.0	839,301
Cassava	17.2	23.4	18.9	732,689	18.8	26.2	21.0	161,585	16.9	22.6	18.4	571,104
Plantain	9.6	14.2	10.8	419,451	12.4	19.5	14.5	111,331	8.9	12.7	9.9	308,120
Yam	8.5	3.5	7.2	277,988	8.7	5.1	7.6	58,558	8.5	3.0	7.1	219,430
Groundnuts	6.3	7.9	6.8	261,721	3.9	5.0	4.3	32,759	6.9	8.8	7.4	228,962
Millet	5.6	2.7	4.8	186,080	2.8	1.1	2.3	17,548	6.2	3.1	5.4	168,532
Rice	4.2	3.6	4.0	156,768	3.8	1.6	3.1	24,190	4.3	4.2	4.3	132,578
Cocoyam	3.3	5.3	3.9	149,543	3.7	7.0	4.7	36,184	3.3	4.8	3.6	113,359
Pepper (Hot)	2.1	4.2	2.7	103,744	2.2	3.7	2.6	20,269	2.1	4.3	2.7	83,475
Sorghum	2.6	1.2	2.2	85,694	0.8	0.3	0.6	4,982	3.0	1.4	2.6	80,712
Cowpeas	2.3	1.5	2.1	81,086	1.7	0.8	1.4	11,151	2.5	1.7	2.3	69,935
Soya bean	1.9	1.6	1.8	69,310	1.4	0.6	1.2	8,996	2.0	1.9	1.9	60,314
Okra	1.3	2.6	1.7	64,690	1.5	1.6	1.5	11,557	1.3	2.9	1.7	53,133
Tomato	1.5	1.5	1.5	56,947	2.3	1.6	2.1	15,954	1.3	1.4	1.3	40,993
Bambara beans	1.1	1.4	1.2	45,574	0.5	0.4	0.5	3,651	1.2	1.7	1.3	41,923
Garden eggs	0.7	0.8	0.7	28,214	0.9	0.9	0.9	6,988	0.7	0.7	0.7	21,226
Pepper (Sweet)	0.2	0.3	0.3	9,971	0.4	0.4	0.4	3,088	0.2	0.3	0.2	6,883
Stringed Beans	0.3	0.1	0.2	9,264	0.3	0.1	0.2	1,846	0.3	0.1	0.2	7,418
Sweet Potato	0.2	0.2	0.2	8,902	0.2	0.2	0.2	1,567	0.2	0.2	0.2	7,335
Onions	0.2	0.2	0.2	8,545	0.3	0.2	0.3	2,289	0.2	0.2	0.2	6,256
Ginger	0.2	0.2	0.2	8,458	0.3	0.2	0.2	1,897	0.2	0.2	0.2	6,561
Pineapples	0.2	0.1	0.2	7,737	0.2	0.1	0.2	1,428	0.2	0.1	0.2	6,309
Cabbage	0.2	0.1	0.2	7,336	0.4	0.1	0.3	2,514	0.2	0.0	0.2	4,822
Sugar Cane	0.2	0.1	0.2	6,806	0.2	0.1	0.2	1,326	0.2	0.2	0.2	5,480
Watermelon	0.2	0.1	0.1	5,604	0.2	0.1	0.2	1,493	0.2	0.1	0.1	4,111
Others	0.7	0.7	0.7	25,775	1.0	0.7	0.9	6,848	0.6	0.6	0.6	18,927

*A person could be a holder of more than one arable crop.

8.3.1 Starchy staple crops

Almost all holders (96.9%) cultivating cocoyam intercropped with other crops (Table 8.12). Similarly, high proportions of holders growing plantain (83.6%), taro (81.0%) and cassava (80.6%) practice mixed-cropping. Conversely, majority of holders producing rice (90.0%) grow it as a single crop. The same can be said of sweet potato (67.8%), and maize (54.0%) to a less extent.

Holders who practice mixed-cropping are prevalent among those who cultivate cassava (31.0%), maize (25.5%) and plantain (18.4%). For mono-cropping, holders predominantly grow maize (48.9%) and to a less extent cassava (12.1%), rice (12.0%) and yam (11.4%) see (Table 8.12).

Table 8.12: Starchy staple crop holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of starchy staple	Mono-cropping				Mixed-cropping				Percentage of starchy holders	
									Mono-cropping	Mixed-cropping
crop	Urban	Rural	Total	Percent	Urban	Rural	Total	Percent		
Total	242,287	929,605	1171892	100	393,447	1511263	1904710	100	38.1	61.9
Maize	51.6	48.1	572,279	48.9	24.0	25.9	486,602	25.5	54	46
Rice	9.1	12.8	141,014	12	0.6	0.9	15,754	0.8	90	10
Millet	2.3	7.6	76,406	6.5	3.0	6.5	109,674	5.8	41.1	58.9
Sorghum	0.7	2.7	27,241	2.3	0.8	3.7	58,453	3.1	31.8	68.2
Cassava	13.0	11.9	142,136	12.1	33.1	30.5	590,553	31	19.4	80.6
Yam	12.2	11.2	133,268	11.4	7.4	7.6	144,720	7.6	47.9	52.1
Cocoyam	0.6	0.3	4,663	0.4	8.8	7.3	144,880	7.6	3.1	96.9
Taro	0.0	0.0	115	0	0.0	0.0	491	0	19	81
Sweet Potato	0.4	0.5	6,038	0.5	0.2	0.1	2,864	0.2	67.8	32.2
Plantain	10.1	4.8	68,732	5.9	22.1	17.5	350,719	18.4	16.4	83.6

8.3.2 Pulses/legumes crops

Holders cultivating four out of five pulses/legumes crops (pigeon pea, groundnuts, soya beans and cowpea) predominantly use the mono-cropping system. For the cultivation of bambara beans, holders intercropped with other crops (69.1%), see Table 8.13.

The table further shows that among holders cultivating single crops (mono-cropping), groundnut constitutes (60.6%) followed distantly by cowpea (17.6%) and closely by soya beans (15.7%). But for holders who practice mixed-cropping, 51.9 percent grow groundnuts and 17.6 percent grow cowpea. Holders cultivating bambara beans constitute 15.6 percent, the third highest. In rural areas, a higher proportion of holders cultivate bambara beans using mixed (16.3%) than mono (5.6%) cropping.

Table 8.13: Pulse/legumes crop holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of pulses/legumes	Mono-cropping			Percent	Mixed-cropping			Percent	Percent	
	Urban	Rural	Total		Urban	Rural	Total		Mono-cropping	fixed-cropping
Total	36,442	223,195	259,637	100	20,286	180,758	201,044	100	56.4	43.6
Bambara beans	4.2	5.6	14,060	5.4	10.5	16.3	31,514	15.6	30.9	69.1
Cowpeas	19.2	17.3	45,728	17.6	20.4	17.3	35,358	17.6	56.4	43.6
Groundnuts	59.5	60.8	157,341	60.6	54.7	51.6	104,380	51.9	60.1	39.9
Pigeon peas	0.2	0.8	1,862	0.7	0.4	0.6	1,128	0.6	62.3	37.7
Soya beans	16.9	15.5	40,646	15.7	14.0	14.3	28,664	14.3	58.6	41.4

8.3.3 Herbs, spices and condiment crops

The proportion of herbs/spices/condiments holders who practice mono-cropping (50.6%) is almost the same as those who practice mixed-cropping (49.4%). Among the holders practicing mono-cropping, 84.4 percent cultivate hot pepper. For mixed-cropping, 90.7 percent of holders cultivate hot pepper (Table 8.14). Among hot pepper growers, mono-cropping and mixed-cropping are almost equally used.

Ginger is predominantly cultivated by mono-cropping as eight in ten ginger holders use the mono-cropping system. Moreover, the proportion of holders cultivating ginger using the mono-cropping system (11.6%) is the second highest and more than four times compared to mixed-cropping (2.6%).

Table 8.14: Herbs/spices holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of herbs, spices/condiment	Mono-cropping				Mixed-cropping				Percent	
	Urban	Rural	Total	Percent	Urban	Rural	Total	Percent	Mono	Mix
Total	11,552	48,433	59,985	100	11,841	46,731	58,572	100	50.6	49.4
Black pepper	2.1	2.0	1,231	2.1	2.4	2.0	1,219	2.1	50.2	49.8
Ginger	13.1	11.2	6,934	11.6	3.2	2.4	1,524	2.6	82	18.0
Nutmeg	0.2	0.2	101	0.2	0.0	0.0	22	0.0	82.1	17.9
Garlic	0.1	0.0	16	0.0	0.0	0.0	15	0.0	51.6	48.4
Pepper (Hot)	82.8	84.7	50,607	84.4	90.4	90.8	53,137	90.7	48.8	51.2
Melon Seeds (Agusi)	1.5	1.7	1,006	1.7	3.8	4.6	2,615	4.5	27.8	72.2
Herbs and Spices	0.1	0.1	45	0.1	0.1	0.0	25	0.0	64.3	35.7
Dandelion	0.1	0.1	45	0.1	0.1	0.0	15	0.0	75	25.0

8.3.4 Horticultural crops

Horticultural crop holders (72.5%) mostly use the mono-cropping system. Among holders who use the mono-cropping system, pineapple (49.6%) and watermelon (42.3%) are the most common crops grown. With exception of sweetsop and soursop holders who predominantly use mixed-cropping (64.4% and 76.9% respectively), the six other horticultural crop holders use mono-cropping with shares ranging from 55.6 percent (passion fruits) to 83.0 percent (tiger nut), see Table 8.15.

Table 8.15: Horticultural crop holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of crop	Mono-cropping				Mixed-cropping				Percent	
	Urban	Rural	Total	Percent	Urban	Rural	Total	Percent	Mono-cropping	Mixed-cropping
Total	2,209	8,284	10,493	100	873	3,107	3,980	100	72.5	27.5
Flowers	0.8	0.1	24	0.2	1.7	0.2	20	0.5	54.5	45.5
Pineapples	45.0	50.8	5,200	49.6	49.6	67.7	2,537	63.7	67.2	32.8
Watermelon	51.5	39.8	4,435	42.3	40.7	26.2	1,169	29.4	79.1	20.9
Passion fruit	0.4	0.1	20	0.2	0.9	0.3	16	0.4	55.6	44.4
Sweetsop	0.1	0.1	15	0.1	1.6	0.5	31	0.8	32.6	67.4
Soursop	0.1	0.1	9	0.1	2.4	0.3	30	0.8	23.1	76.9
Butternut squash	0.4	0.6	56	0.5	1.3	0.5	27	0.7	67.5	32.5
Tiger nut	1.7	8.4	734	7.0	1.8	4.3	150	3.8	83.0	17.0

8.3.5 Non-leafy Vegetable crops

More than half (53.0%) of non-leafy vegetable crop holders practice mixed-cropping. Holders producing garden eggs, okra and tomatoes have relatively higher representation in both systems of production. However, holders who grow tomato use mono-cropping more, while okra and garden eggs holders are more inclined to mixed-cropping.

The major non-leafy vegetables grown using mixed-cropping are shallots (67.6%), okra (63.6%) and garden eggs (63.5%). The crops with high proportions in mono-cropping are onion (78.6%), cabbage (66.2%), carrot (64.9%) and stringed bean (60.6%).

About three-quarters of holders who use mono-cropping system are engaged mainly in the cultivation of three non-leafy vegetables crops – tomatoes (34.9%), okra (26.3%) and garden eggs (11.5%). For the mixed-cropping system holders, 40.7 percent are engaged in okra, 25.5 percent spring onions and 17.7 percent garden eggs (Table 8.16).

Table 8.16: Non-leafy vegetable holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of non-leafy vegetables	Mono-cropping				Mixed-cropping				Percent	
	Urban	Rural	Total	%	Urban	Rural	Total	%	Mono-cropping	Mixed-cropping
Total	23,755	65,738	89,493	100	23,508	77,433	100,941	100	47	53
Asian vegetables	0.0	0.0	11	0	0.0	0.0	9	0	55	45
Cabbage	6.2	5.1	4,854	5.4	4.4	1.9	2,482	2.5	66.2	33.8
Carrots	4.2	1.0	1,657	1.9	2.4	0.4	895	0.9	64.9	35.1
Garden eggs	11.5	11.5	10,309	11.5	18.1	17.6	17,905	17.7	36.5	63.5
Lettuce	0.9	0.1	316	0.4	1.1	0.2	418	0.4	43.1	56.9
Stringed Beans	6.1	6.3	5,614	6.3	1.7	4.2	3,650	3.6	60.6	39.4
Okra	17.1	29.7	23,576	26.3	31.9	43.4	41,114	40.7	36.4	63.6
Pepper (Sweet)	5.8	4.3	4,171	4.7	7.3	5.3	5,800	5.7	41.8	58.2
Cucumber	1.0	0.7	712	0.8	1.1	0.5	666	0.7	51.7	48.3
Spring Onions	0.4	0.1	188	0.2	0.5	0.1	181	0.2	50.9	49.1
Tomato	39.9	33.1	31,231	34.9	27.6	24.8	25,716	25.5	54.8	45.2
Onions	6.7	7.8	6,720	7.5	2.9	1.5	1,825	1.8	78.6	21.4
Shallots	0.2	0.1	134	0.1	1.0	0.1	280	0.3	32.4	67.6

8.3.6 Leafy vegetable crops

Seven in ten leafy vegetable holders use mixed-cropping. Holders who cultivate pumpkin leaves (96.8%), bitter leaf (85.7%) and amaranthus (82.7%) use mixed-cropping substantially more relative to mono-cropping. Among holders who use the mono-cropping system, 34.7 percent cultivate *ayoyo/ademe* and 19.6 percent cultivate *gboma* representing almost three-quarters of holders using the mono-cropping system. For holders who use the mixed-cropping system, 28.5 percent cultivate *ayoyo/ademe*, 14.5 percent cultivate pumpkin leaves and 12.2 percent grow *gboma*, representing over 80 percent (Table 8.17).

Table 8.17: Leafy vegetable holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of leafy vegetables	Mono-cropping				Mixed-cropping				Leafy vegetables crops	
	Urban	Rural	Total	Percent	Urban	Rural	Total	Percent	Mono-cropping	Mixed-cropping
Total	522	732	1,254	100.0	907	2,045	2,952	100.0	29.8	70.2
Gboma	17.8	20.9	246	19.6	14.7	11.1	359	12.2	40.7	59.3
Bitter leaf	1.9	4.2	41	3.3	5.2	9.7	245	8.3	14.3	85.7
Amaranthus	2.5	1.9	27	2.2	4.2	4.4	129	4.4	17.3	82.7
Spinach	3.6	6.8	69	5.5	5.5	2.9	109	3.7	38.8	61.2
Pumpkin leaves	1.0	1.2	14	1.1	6.4	18.1	429	14.5	3.2	96.8
Moringa	5.6	5.7	71	5.7	3.9	2.0	75	2.5	48.6	51.4
Ayoyo/ Ademe	34.1	35.4	437	34.7	31.3	27.3	843	28.5	34.1	65.9
Other leafy vegetables	21.3	18.7	248	19.8	27.7	24.2	746	25.3	24.9	75.1
Mushroom*	12.3	5.1	101	8.1	1.2	0.3	17	0.6	85.6	14.4

*A fungus classified under leafy vegetables for convenience

8.3.7 Industrial crops

About 73 percent of holders of industrial crops use the mono-cropping system and this is predominant among holders of cotton (95.0%), sisal (82.5%), sugar cane (78.7%) and tobacco (78.3%). Among holders who use mono-cropping, 62.3 percent cultivate sugar cane followed distantly by cotton (16.1%) and ornamental crops (10.3%). Among holders who use mixed-cropping, 45.0 percent cultivate sugar cane, 28.5 percent grow kenaf and 15.6 percent produce ornamental crops (Table 8.18).

Table 8.18: Industrial crop holders 15 years or older by type of crop, and by type of cropping system and type of locality

Type of crop	Mono-cropping			Mixed-cropping			All industrial crops	
	Urban	Rural	Total	Urban	Rural	Total	Mono-cropping	Mixed-cropping
Total	1,139	7,457	8,596	811	2,418	3,229	72.7	27.3
Citronella	1.0	0.3	0.4	0.5	0.7	0.7	59.3	40.7
Cotton	2.0	18.2	16.1	0.1	3.0	2.3	95.0	5.0
Jute	0.0	0.0	0.0	0.2	0.2	0.2	12.5	87.5
Kenaf	0.3	0.5	0.5	20.6	31.1	28.5	4.3	95.7
Sissal	1.5	3.5	3.2	0.7	2.2	1.8	82.5	17.5
sweetberry	0.0	0.0	0.0	0.2	0.2	0.2	33.3	66.7
Sugar Cane	73.3	60.6	62.3	60.5	39.7	45.0	78.7	21.3
Tobacco	1.7	8.0	7.2	0.7	6.8	5.3	78.3	21.7
Sunflowers	0.0	0.0	0.0	0.4	0.0	0.1	50.0	50.0
Seri-culture	0.0	0.0	0.0	0.0	0.5	0.4	14.3	85.7
Ornamental	20.3	8.7	10.3	15.9	15.5	15.6	63.7	36.3

8.4 Land parcels, type of land tenure arrangements and type of locality of arable land holders

The number of land parcels used in the cultivation of arable crops is 2,172,983 of which 47.9 percent are owned through freehold and an additional one-quarter owned through inheritance. About three-quarters of parcels used for cultivation of arable crops are owned by males. Ownership by freehold and inheritance constitute 72.9 percent of land parcels under arable crop cultivation followed by renting (10.4%).

Ownership by freehold means "free from hold" of any entity besides the owner. The owner enjoys free ownership for perpetuity and can use the land for any purpose in accordance with the local regulations.

Ownership by inheritance refers to land which is passed on to a person upon the death of the owner.

However, holders of 2.3 percent of the parcels used for the cultivation of arable crops are squatters. A similar pattern of land tenure arrangements exists between male and female holders as well as in the rural and urban areas (Table 8.19).

Table 8.19: Land parcels used in cultivating arable crop by type of land tenure arrangement, and by sex of holder and by type of locality

Type of tenure	Sex of holder		Type of locality			Number of parcels
	Male	Female	Urban	Rural	Total	
Total	1,598,207	574,776	451,898	1,721,085	100.0	2,172,983
Own/free Holding	49.0	44.9	45.7	48.5	47.9	1,040,458
Inheritance	24.1	27.3	21.1	26.0	25.0	542,977
Leasehold	4.2	5.2	5.1	4.3	4.5	97,701
Renting	10.7	9.7	14.4	9.4	10.4	226,200
Share-cropping	7.6	6.3	6.3	7.5	7.2	156,888
Squatting	2.1	3.0	3.3	2.1	2.3	51,015
Trusteeship	2.2	3.4	3.7	2.2	2.5	53,954
Other	0.2	0.2	0.3	0.1	0.2	3,790

With the exception of holders cultivating horticultural crops (29.1%) and non-leafy vegetables (21.9%), where renting ranked second to freehold, ownership by freehold and inheritance is the most common land tenure arrangements for all crop types. Although squatting is not an acceptable tenure arrangement, the prevalence is higher than share-cropping and trusteeship for the cultivation of leafy vegetables and pulses/legumes. The pattern is similar for males but for female holders cultivating non-leafy vegetables, inheritance ranks second to freehold (Table 8.20).

Table 8.20: Arable crop holders 15 years or older by type of arable crop and sex, and by type of land tenure arrangement

Type of crop	Own/free holding	Inheritance	Lease-hold	Renting	Share-cropping	Squatting	Trustee-ship	Other	Total
Both Sexes									
All crops	1,845,565	1,006,288	167,027	355,670	306,307	90,968	98,534	6,419	3,876,778
Starchy staples	47.7	25.5	4.2	8.4	9.1	2.3	2.6	0.2	3,076,602
Pulses/legumes	52.8	31.6	3.5	6.3	1.3	2.3	2.1	0.1	460,681
Herbs/spices	40.7	23.8	5.8	17	6.8	3	2.6	0.2	118,557
Horticulture	33.7	17.1	12.7	29.1	3.7	1.8	1.7	0.2	14,473
Leafy vegetables	47.6	20.9	6.1	13.4	3.7	4.7	3	0.6	4,206
Non-leafy vegetables	38.8	20.9	6	21.9	6.2	3	3	0.3	190,434
Industrial crops	38.9	35.8	4.8	11	5.6	1.9	1.9	0.1	10,438
Males									
Total	1,110,536	560,508	93,028	193,858	216,907	48,166	52,344	3,747	2,279,094
Starchy staples	48.7	24.6	4.1	8.5	9.5	2.1	2.3	0.2	2,279,094
Pulses/legumes	54.9	31.9	2.9	5.9	1.3	1.8	1.4	0.1	331,171
Herbs/spices	39.2	21.7	5.4	20.3	8.6	2.3	2.3	0.2	70,666
Horticulture	33.4	16.9	13	29.4	3.7	1.7	1.6	0.2	12,399
Leafy vegetables	46.5	21.3	6.1	14.6	3.1	4.3	3.5	0.6	2,487
Non-leafy vegetables	37.3	19.1	5.6	25.4	7	2.6	2.7	0.2	131,938
Industrial crops	40.7	34.0	4.8	10.7	5.9	1.9	2.0	0.0	8,330
Females									
Total	358,021	224,719	36,998	64,824	61,900	22,531	27,141	1,374	797,508
Starchy staples	44.9	28.2	4.6	8.1	7.8	2.8	3.4	0.2	797,508
Pulses/legumes	47.6	30.9	5.1	7.2	1.6	3.5	4	0.1	129,510
Herbs/spices	42.9	26.9	6.2	12.3	4.2	3.9	3.2	0.4	47,891
Horticulture	35.6	18.3	10.8	26.8	3.5	2.5	2.2	0.2	2,074
Leafy vegetables	49.3	20.3	6.1	11.5	4.7	5.3	2.3	0.6	1,719
Non-leafy vegetables	42	24.9	6.9	13.8	4.5	3.9	3.6	0.3	58,496
Industrial crops	32.1	42.9	4.5	12.2	4.6	1.9	1.6	0.1	2,108

**A person could be a holder of more than one arable crop*

8.4.1 Land tenure arrangements of parcels for starchy staple holders

Majority of starchy staple holders own parcels of land through freehold (47.7%) and inheritance (25.5%). Among starchy staple crops, majority of the holders of four crops, namely, taro (58.3%), yam (55.2%), millet (54.8%) and sorghum (51.8%) own the parcels of land on which the crops are cultivated through freehold (Table 8.21). The prevailing tenure arrangement for the cultivation of millet and sorghum is ownership by freehold and inheritance with about 95 percent of holders.

In all, ownership by inheritance comes second to ownership by freehold for all types of starchy staples except for sweet potatoes where ownership by inheritance (31.0%) is followed by freehold (28.7%) and renting (24.5%). Squatting is generally the lowest form of tenure arrangement except for taro, where renting, leasehold and trusteeship have lower proportions.

The pattern is similar for female holders except for those who cultivate taro, where squatting is the third type of tenure arrangement followed by leasehold (Table 8.21).

Table 8.21: Starchy staple crop holders 15 years or older by type of crop and sex, and by type of land tenure arrangement

Type of crop	Own/ free holding	Inheritance	Lease-hold	Renting	Share-cropping	Squatting	Trustee-ship	Other	Total
Both sexes	1,468,557	785,227	130,026	258,682	278,807	70,697	79,485	5,121	
Total	47.7	25.5	4.2	8.4	9.1	2.3	2.6	0.2	3,076,602
Maize	46.0	25.6	3.9	11.3	8.2	2.3	2.5	0.2	1,058,881
Rice	49.6	25.3	5.6	9.9	5.4	1.9	2.3	0.1	156,768
Millet	54.8	40.2	1.6	1.6	0.2	0.6	0.9	0.1	186,080
Sorghum	51.8	42.5	2.4	1.4	0.2	0.7	0.9	0.0	85,694
Cassava	43.6	24.0	4.9	9.1	12.7	2.5	3.1	0.2	732,689
Yam	55.2	22.2	4.3	10.0	3.5	2.4	2.2	0.2	277,988
Cocoyam	49.2	22.9	4.2	3.3	13.6	2.8	3.6	0.3	149,543
Taro	58.3	16.3	4.0	4.8	7.6	5.4	3.3	0.3	606
Sweet Potato	28.7	31.0	4.5	24.5	6.7	1.8	2.7	0.2	8,902
Plantain	49.5	21.2	4.8	4.3	14.0	2.9	3.1	0.2	419,451
Male	1,110,536	560,508	93,028	193,858	216,907	48,166	52,344	3,747	
Total	48.7	24.6	4.1	8.5	9.5	2.1	2.3	0.2	2,279,094
Maize	47.6	24.6	3.8	11.0	8.3	2.2	2.2	0.2	823,081
Rice	52.7	23.1	4.3	9.9	5.6	2.0	2.3	0.1	119,311
Millet	56.0	39.3	1.6	1.5	0.2	0.6	0.8	0.1	157,924
Sorghum	52.6	42.1	2.2	1.4	0.2	0.6	0.8	0.0	73,622
Cassava	43.7	22.8	4.9	9.3	14.3	2.2	2.7	0.2	489,401
Yam	55.6	21.6	4.4	10.2	3.5	2.3	2.2	0.2	241,803
Cocoyam	48.7	20.2	4.4	3.6	17.4	2.4	3.1	0.3	94,831
Taro	53.6	18.4	3.1	6.1	9.4	4.8	4.3	0.3	392
Sweet Potato	29.6	32.3	4.5	23.0	6.2	1.7	2.6	0.2	6,869
Plantain	48.5	19.3	4.9	4.6	17.1	2.6	2.7	0.2	271,860
Female	358,021	224,719	36,998	64,824	61,900	22,531	27,141	1,374	
Total	44.9	28.2	4.6	8.1	7.8	2.8	3.4	0.2	797,508
Maize	40.3	29.0	4.4	12.0	8.2	2.7	3.3	0.2	235,800
Rice	39.8	32.3	9.4	10.0	4.6	1.4	2.5	0.1	37,457
Millet	48.2	45.3	2.2	1.8	0.4	0.7	1.3	0.0	28,156
Sorghum	46.8	44.9	3.6	1.4	0.3	1.4	1.5	0.0	12,072
Cassava	43.6	26.5	4.9	8.6	9.5	3.0	3.7	0.2	243,288
Yam	52.7	26.2	3.3	8.8	3.3	3.0	2.5	0.2	36,185
Cocoyam	50.2	27.5	4.0	2.9	7.2	3.5	4.5	0.2	54,712
Taro	66.8	12.6	5.6	2.3	4.2	6.5	1.4	0.5	214
Sweet Potato	25.9	26.6	4.7	29.5	8.2	2.0	3.0	0.2	2,033
Plantain	51.2	24.8	4.6	3.8	8.3	3.4	3.7	0.2	147,591

8.4.2 Land tenure arrangements of parcels for pulses/legumes holders

Ownership by freehold and inheritance is the dominant form of tenure in pulses/legumes cultivation, constituting 84.4 percent of holders, with freehold accounting for 52.8% and inheritance 31.6%. Leasing and renting of land is the next common form of tenure in the cultivation of pulses/legumes and together constitute 9.8 percent of holders.

The proportion of holders who rent or lease is relatively higher (13.7%) in the cultivation of cowpeas than the other pulses/legumes. A higher proportion of male (86.8%) than female (78.5%) pulses/legumes holders either own or inherited the parcels of land, while a higher proportion of female (12.3%) than male (8.8%) holders rent or lease the parcels of land (Table 8.22). For all categories of pulses/legumes, at least 40 percent of holders owned the parcels of land by freehold type of tenure arrangement while more than a quarter owned the parcels of land by inheritance. Ownership by freehold is higher than inheritance in all types of pulses/legumes, except for pigeon peas where the opposite holds. Squatting is higher among females than among males (3.5% compared to 1.8% respectively) for all crops, except for holders of pigeon peas (Table 8.22).

Table 8.22: Pulses and legumes holders 15 years or older by type of crop and sex, and by type of land tenure arrangement

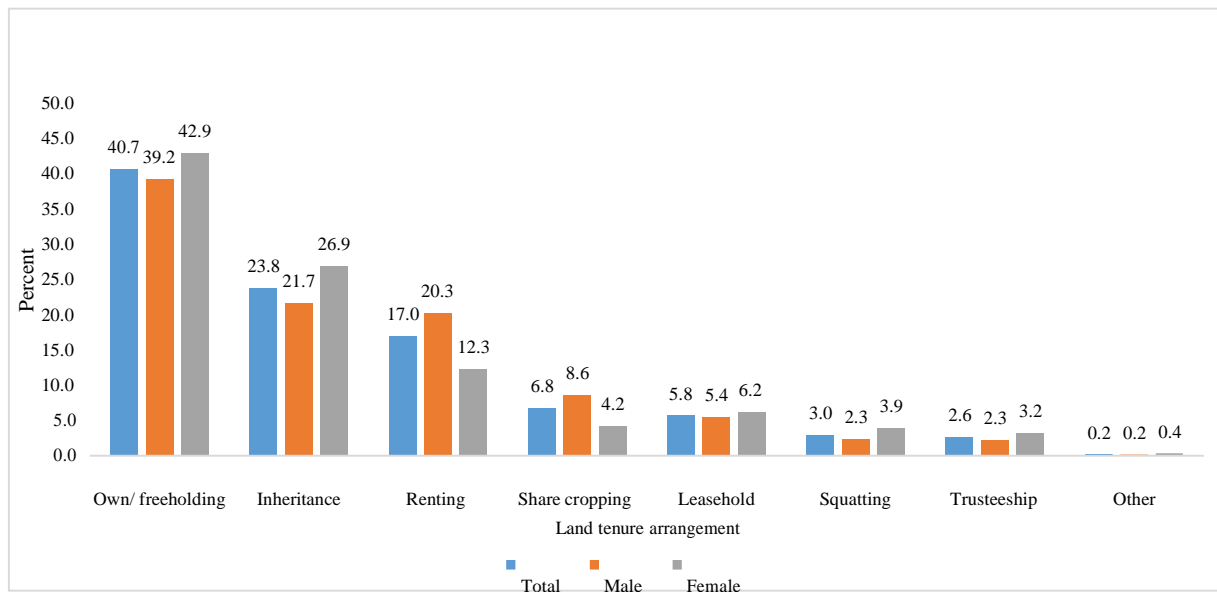
Type of crop	Own/ Free holding	Inheritance	Leasehold	Renting	Share- cropping	Squatting	Trusteeship	Other	Total
Both sexes	243,305	145,500	16,086	29,060	6,192	10,398	9,699	431	
Total	52.8	31.6	3.5	6.3	1.3	2.3	2.1	0.1	460,681
Bambara beans	48.0	38.6	4.0	4.9	1.1	1.7	1.7	0.1	45,574
Cowpeas	49.5	30.6	3.9	9.8	2.3	2.3	1.5	0.1	81,086
Groundnuts	55.2	28.8	3.2	6.5	1.3	2.6	2.2	0.1	261,721
Pigeon peas	40.1	50.7	1.0	2.0	1.1	1.5	3.4	0.1	2,990
Soya bean	51.3	37.8	3.7	2.8	0.6	1.2	2.6	0.1	69,310
Male	181,650	105,531	9,508	19,683	4,143	5,873	4,491	292	
Total	54.9	31.9	2.9	5.9	1.3	1.8	1.4	0.1	331,171
Bambara beans	49.4	38.6	2.7	5.3	1.1	1.7	1.0	0.1	31,086
Cowpeas	50.8	29.6	3.5	10.2	2.4	2.2	1.2	0.1	65,869
Groundnuts	57.7	29.3	2.9	5.7	1.1	1.8	1.4	0.1	179,240
Pigeon peas	43.2	48.1	1.0	1.9	1.1	1.6	3.1	0.1	2,376
Soya bean	53.8	38.6	2.3	2.1	0.5	1.1	1.6	0.1	52,600
Female	61,655	39,969	6,578	9,377	2,049	4,525	5,208	149	
Total	47.6	30.9	5.1	7.2	1.6	3.5	4.0	0.1	129,510
Bambara beans	45.0	38.5	6.8	3.9	0.9	1.8	3.1	0.1	14,488
Cowpeas	43.7	34.8	5.6	8.0	2.2	2.8	2.8	0.1	15,217
Groundnuts	49.8	27.6	4.1	8.2	1.7	4.4	4.1	0.1	82,481
Pigeon peas	28.2	61.1	1.3	2.4	1.1	1.0	4.7	0.2	614
Soya bean	43.3	35.4	8.2	4.7	0.9	1.5	5.8	0.0	16,710

8.4.3 Land tenure arrangements of parcels for herbs/spices/condiments holders

The most common form of tenure used for herbs/spices are ownership by freehold and inheritance which together constitute 64.5 percent. Four in ten holders who cultivate herbs/spices/condiments own their parcels of land by freehold and 23.8 percent by inheritance. The third form of tenure is by renting (17.0%), see Figure 8.3.

A higher proportion of female holders in the cultivation of herbs/spices/condiments own the parcels by freehold (42.9%) or by inheritance (26.9%) compared to their male counterparts (39.2% and 21.7% respectively). However, renting of parcels is more common among males (20.3%) than females (12.3%).

Figure 8.3: Type of land tenure arrangements of herb/spices holders by sex (percent)



Except for ginger, dandelion and the “other herbs and spices” category, more than 40.0 percent of holders who cultivate the various herbs/spices/condiments own their parcels of land.

Among holders cultivating herbs and spices, nutmeg holders (35.0%) more commonly rent their parcels. Share-cropping is more common among holders who cultivate ginger (21.8%) than the holders who cultivate “other herbs and spices” (less than 7%).

Ownership by inheritance is the second highest type of land tenure for all types of herbs and spices, except in the cultivation of ginger, nutmeg and garlic where renting is second to ownership by freehold. The pattern holds true for males; but for females, ownership by inheritance is second to freehold in the cultivation of ginger (Table 8.23).

Table 8.23: Herbs and spices holders 15 years or older by type of herb/spices and sex, and by type of land tenure arrangement

Type of crop	Own/ free holding	Inheritance	Lease- hold	Renting	Share- cropping	Squatting	Trustee- ship	Other	Total
Both sexes	48,269	28,242	6,837	20,192	8,104	3,508	3,115	290	
Total	40.7	23.8	5.8	17.0	6.8	3.0	2.6	0.2	118,557
Black pepper	40.8	28.9	6.0	13.1	6.4	2.2	2.5	0.1	2,450
Ginger	29.9	17.9	3.4	21.5	21.8	2.7	2.6	0.1	8,458
Nutmeg	47.2	12.2	2.4	35.0	3.3	0.0	0.0	0.0	123
Garlic	58.1	9.7	6.5	19.4	3.2	0.0	3.2	0.0	31
Pepper (Hot)	41.5	23.8	5.8	17.3	5.8	3.0	2.6	0.3	103,744
Melon Seeds(Agusi)	44.2	34.1	11.4	1.8	0.8	3.5	4.1	0.2	3,621
Other Herbs and Species	32.9	45.7	1.4	8.6	5.7	2.9	2.9	0.0	70
Dandelion	28.3	48.3	1.7	8.3	6.7	3.3	3.3	0.0	60
Male	27,708	15,337	3,849	14,321	6,100	1,635	1,595	121	
Total	39.2	21.7	5.4	20.3	8.6	2.3	2.3	0.2	70,666
Black pepper	38.1	30.4	4.5	14.6	8.2	1.6	2.5	0.1	1,532
Ginger	27.8	16.3	3.3	22.9	24.9	2.3	2.4	0.1	6,301
Nutmeg	64.6	13.8	4.6	13.8	3.1	0.0	0.0	0.0	65
Garlic	55.0	10.0	5.0	20.0	5.0	0.0	5.0	0.0	20
Pepper (Hot)	40.2	21.5	5.6	20.9	7.3	2.2	2.2	0.2	60,285
Melon Seeds(Agusi)	45.0	35.5	7.7	2.3	0.4	4.6	4.3	0.1	2,367
Other Herbs and Species	29.4	49.0	2.0	9.8	5.9	2.0	2.0	0.0	51
Dandelion	26.7	51.1	2.2	8.9	6.7	2.2	2.2	0.0	45
Female	20,561	12,905	2,988	5,871	2,004	1,873	1,520	169	
Total	42.9	26.9	6.2	12.3	4.2	3.9	3.2	0.4	47,891
Black pepper	45.3	26.3	8.5	10.5	3.5	3.4	2.6	0.0	918
Ginger	36.2	22.5	3.5	17.6	12.7	3.9	3.4	0.2	2,157
Nutmeg	27.6	10.3	0.0	58.6	3.4	0.0	0.0	0.0	58
Garlic	63.6	9.1	9.1	18.2	0.0	0.0	0.0	0.0	11
Pepper (Hot)	43.2	27.1	6.0	12.3	3.9	4.0	3.2	0.4	43,459
Melon Seeds(Agusi)	42.7	31.3	18.3	0.9	1.5	1.3	3.7	0.2	1,254
Other Herbs and Species	42.1	36.8	0.0	5.3	5.3	5.3	5.3	0.0	19
Dandelion	33.3	40.0	0.0	6.7	6.7	6.7	6.7	0.0	15

8.4.4 Land tenure arrangements of parcels for horticulture holders

About half (50.8%) of holders who cultivate horticultural crops either owned the parcels by freehold (33.7%) or inheritance (17.1%). For three (butternut squash, watermelon and pineapple) out of the eight horticultural crop types, renting of parcels ranks second to ownership by freehold. Ownership by inheritance is the highest for holders who cultivate tiger nuts (45.9%).

Among horticultural crop holders who cultivate soursop, flowers, passion fruits and sweetsop, seven in ten own their parcels either by freehold or inheritance. Higher proportions of females who are into horticultural crops own their parcels compared to their male counterparts with the exception of soursop, watermelon, and tiger nuts where the proportion of males are higher than females (Table 8.24).

For renting of parcels, the proportion of males cultivating butternut squash and sweetsop are more than double the proportion of females. For parcels used for passion fruit cultivation, 14.3 percent of females practice share-cropping while males hardly engage in this type of tenure arrangement. The reverse is the case for trusteeship arrangement of which 10.3 percent of males cultivating passion fruits practice share-cropping.

Table 8.24: Horticultural crop holders 15 years or older by type of crop and sex, and by type of land tenure arrangement

Type of crop	Own/ free holding	Inheritance	Lease-hold	Renting	Share-cropping	Squatting	Trustee-ship	Other	Total
Both sexes	4,874	2,478	1,836	4,206	537	261	250	31	
Total	33.7	17.1	12.7	29.1	3.7	1.8	1.7	0.2	14,473
Flowers	77.3	4.5	4.5	4.5	0.0	2.3	2.3	4.5	44
Pineapples	29.5	16.0	17.3	28.0	4.9	2.1	2.1	0.2	7,737
Watermelon	40.1	14.3	7.5	33.4	1.8	1.6	1.1	0.2	5,604
Passion Fruit	61.1	13.9	8.3	2.8	2.8	0.0	8.3	2.8	36
Sweetsop	54.3	19.6	0.0	13.0	4.3	2.2	6.5	0.0	46
Soursop	64.1	23.1	2.6	5.1	0.0	0.0	2.6	2.6	39
Butternut squash	26.5	14.5	4.8	39.8	7.2	1.2	4.8	1.2	83
Tiger nut	24.3	45.9	7.4	14.1	5.5	0.8	1.5	0.5	884
Male	4,136	2,098	1,612	3,650	464	209	204	26	
Total	33.4	16.9	13.0	29.4	3.7	1.7	1.6	0.2	12,399
Flowers	72.4	3.4	6.9	6.9	0.0	3.4	3.4	3.4	29
Pineapples	28.2	15.5	18.3	29.1	5.0	1.8	2.0	0.2	6,587
Watermelon	40.8	14.3	7.3	32.7	2.0	1.7	1.1	0.2	4,956
Passion Fruit	58.6	13.8	10.3	3.4	0.0	0.0	10.3	3.4	29
Sweetsop	50.0	23.3	0.0	16.7	3.3	3.3	3.3	0.0	30
Soursop	70.8	20.8	4.2	4.2	0.0	0.0	0.0	0.0	24
Butternut squash	22.2	13.9	5.6	43.1	6.9	1.4	5.6	1.4	72
Tiger nut	25.4	51.0	5.8	10.7	4.6	0.3	1.6	0.4	672
Female	738	380	224	556	73	52	46	5	
Total	35.6	18.3	10.8	26.8	3.5	2.5	2.2	0.2	2,074
Flowers	86.7	6.7	0.0	0.0	0.0	0.0	0.0	6.7	15
Pineapples	37.4	18.8	11.8	21.4	4.1	3.5	3.0	0.1	1,150
Watermelon	34.3	14.0	9.6	39.0	0.8	1.1	1.1	0.2	648
Passion Fruit	71.4	14.3	0.0	0.0	14.3	0.0	0.0	0.0	7
Sweetsop	62.5	12.5	0.0	6.3	6.3	0.0	12.5	0.0	16
Soursop	53.3	26.7	0.0	6.7	0.0	0.0	6.7	6.7	15
Butternut squash	54.5	18.2	0.0	18.2	9.1	0.0	0.0	0.0	11
Tiger nut	20.8	29.7	12.3	25.0	8.5	2.4	0.9	0.5	212

8.4.5 Land tenure arrangements of parcels for leafy vegetable holders

Close to half (47.6%) of holders who cultivate leafy vegetables own their parcels by freehold and 20.9 percent by inheritance. Apart from gboma, ayoyo/ademe and spinach, more than three-quarters of leafy vegetable holders own their parcels by either freehold or inheritance.

Share-cropping is more common in the cultivation of spinach than other leafy vegetables. The variation between the proportion of holders cultivating spinach and other leafy vegetables, under share-cropping is higher for females (14.2%) than males (5.5%).

A higher proportion of male holders (93.2%) who cultivate pumpkin leaves, own their parcels by either freehold or inheritance than their female counterparts (84.8%). Conversely, a higher proportion of female holders who own or inherited their parcels for amaranthus cultivation stand at 91.0 percent as compared to 84.6 percent of males. This same pattern is exhibited for mushroom holders who own or inherited their parcels (88.9% for females, and 80.2% for males).

There is a higher prevalence of squatting than share-cropping and trusteeship arrangement among the male and female holders in the cultivation of spinach. Further, the prevalence of squatting is higher than the average among holders who cultivate ayoyo/ademe (6.8%), spinach (6.2%) and “other leafy vegetables” (4.9%). This is true for males cultivating spinach (6.1%), ayoyo/ademe

(5.9%) and “other leafy vegetables” (5.0%). For females, the higher proportions are among holders cultivating spinach (6.3%) and ayoyo/ademe (7.7%), see Table 8.25.

Table 8.25: Leafy vegetable holders 15 years or older by type of vegetable and sex, and by type of land tenure arrangement

Type of crop	Own/free holding	Inheritance	Lease-hold	Renting	Share-cropping	Squatting	Trustee-ship	Other	Total
Both sexes	2,004	878	256	562	157	199	126	24	
Total	47.6	20.9	6.1	13.4	3.7	4.7	3.0	0.6	4,206
Gboma	31.6	20.3	10.1	24.8	4.5	4.6	4.1	-	605
Bitter leaf	37.8	49.7	1.0	5.9	1.0	2.8	1.7	-	286
Amaranthus	60.3	27.6	4.5	3.2	1.3	1.9	0.6	0.6	156
Spinach	39.3	21.3	6.2	11.8	10.7	6.2	3.4	1.1	178
Pumpkin leaves	66.6	23.7	3.6	1.8	0.2	2.3	1.6	0.2	443
Moringa	71.9	15.1	4.1	2.7	1.4	-	4.1	0.7	146
Ayoyo/ Ademe	40.8	12.8	8.9	19.1	6.9	6.8	3.9	0.8	1,280
Other leafy vegetables	53.4	23.3	3.4	10.5	1.3	4.9	2.2	0.9	994
Mushroom	74.6	7.6	3.4	6.8	1.7	2.5	3.4	-	118
Male	1,157	529	151	364	77	108	87	14	
Total	46.5	21.3	6.1	14.6	3.1	4.3	3.5	0.6	2,487
Gboma	28.0	16.3	12.0	29.4	3.8	4.1	6.4	-	343
Bitter leaf	31.2	55.0	1.1	7.9	0.5	3.2	1.1	-	189
Amaranthus	55.1	29.5	5.1	3.8	2.6	2.6	1.3	-	78
Spinach	36.7	21.4	7.1	15.3	7.1	6.1	4.1	2.0	98
Pumpkin leaves	63.7	29.5	1.0	2.1	0.3	2.1	1.0	0.3	292
Moringa	73.1	14.4	3.8	2.9	1.0	-	4.8	-	104
Ayoyo/ Ademe	41.3	10.2	9.9	21.6	6.1	5.9	4.3	0.8	658
Other leafy vegetables	51.1	23.5	3.3	11.7	1.6	5.0	2.8	0.9	634
Mushroom	71.4	8.8	4.4	5.5	2.2	3.3	4.4	-	91
Female	847	349	105	198	80	91	39	10	
Total	49.3	20.3	6.1	11.5	4.7	5.3	2.3	0.6	1,719
Gboma	36.3	25.6	7.6	18.7	5.3	5.3	1.1	-	262
Bitter leaf	50.5	39.2	1.0	2.1	2.1	2.1	3.1	-	97
Amaranthus	65.4	25.6	3.8	2.6	-	1.3	-	1.3	78
Spinach	42.5	21.3	5.0	7.5	15.0	6.3	2.5	-	80
Pumpkin leaves	72.2	12.6	8.6	1.3	-	2.6	2.6	-	151
Moringa	69.0	16.7	4.8	2.4	2.4	-	2.4	2.4	42
Ayoyo/ Ademe	40.2	15.6	7.9	16.6	7.7	7.7	3.5	0.8	622
Other leafy vegetables	57.5	23.1	3.6	8.3	0.8	4.7	1.1	0.8	360
Mushroom	85.2	3.7	-	11.1	-	-	-	-	27

8.4.6 Land tenure arrangements of parcels for non-leafy vegetable crop holders

Ownership by freehold (38.8%), leasehold (21.9%) and share-cropping (20.9%) constitute 81.6 percent of the tenure arrangement made by non-leafy vegetable crops holders. With the exception of renting and leasehold, the proportion of female holders is higher than their male counterparts for the other tenure arrangements (Figure 8.4).

Figure 8.4: Type of land tenure arrangements of non-leafy vegetable holders by sex (percent)



Holders involved in the cultivation of stringed beans, okra, and Asian vegetables own higher percentages – 76.6 percent, 66.1 percent, and 65.0 percent respectively – through either freehold or inheritance. In contrast, about four in ten of holders who grow shallots (46.4%), carrots (43.8%), cucumber (38.5%) and cabbage (37.9%) rent their parcels of land.

Relatively higher proportions of holders involved in spring onions and lettuce cultivation, 13.6 percent and 12.9 percent respectively, are squatters compared to less than 6 percent for growers of other types of non-leafy vegetable crops who are squatters.

Apart from renting and share-cropping, where the proportion of males (25.4% and 7.0% respectively) is higher than that of females (13.8% and 4.5% respectively), in all the other types of tenure arrangements, the proportion of females is higher than males (Table 8.26).

Table 8.26: Non-leafy vegetable holders 15 years or older by type of vegetable and sex, and by type of land tenure arrangement

Type of crop	Own/ free holding	Inheritance	Leasehold	Renting	Share-cropping	Squatting	Trusteeship	Other	Total
Both sexes	73,859	39,821	11,440	41,644	11,863	5,667	5,642	498	
Total	38.8	20.9	6.0	21.9	6.2	3.0	3.0	0.3	190,434
Asian vegetables	50.0	15.0	10.0	20.0	-	5.0	-	-	20
Cabbage	30.3	12.4	5.6	37.9	7.7	3.6	2.3	0.3	7,336
Carrots	25.1	10.4	9.2	43.8	2.5	3.6	5.2	0.3	2,552
Garden eggs	36.6	17.7	5.7	24.4	9.5	2.8	3.1	0.2	28,214
Lettuce	36.2	12.0	7.5	24.0	2.0	12.9	4.0	1.4	734
Stringed Beans	50.8	25.8	3.6	10.5	3.8	2.5	2.8	0.1	9,264
Okra	41.4	24.7	6.4	15.4	5.0	3.5	3.1	0.3	64,690
Pepper (Sweet)	40.6	19.9	5.5	20.9	6.7	2.7	3.7	0.2	9,971
Cucumber	29.8	10.1	7.0	38.5	6.6	4.9	2.7	0.4	1,378
Spring Onions	32.5	19.5	6.8	20.6	1.9	13.6	3.5	1.6	369
Tomato	37.5	18.8	5.5	25.7	7.1	2.5	2.7	0.2	56,947
Onions	33.7	24.8	10.0	25.9	1.7	1.4	2.5	0.2	8,545
Shallots	18.6	29.0	2.2	46.4	0.2	1.0	2.7	-	414
Male	49,275	25,235	7,396	33,572	9,251	3,380	3,525	304	
Total	37.3	19.1	5.6	25.4	7.0	2.6	2.7	0.2	131,938
Asian vegetables	44.4	16.7	11.1	22.2	-	5.6	-	-	18
Cabbage	29.5	12.0	5.8	38.7	8.0	3.6	2.3	0.3	6,689
Carrots	24.3	9.8	8.8	45.1	2.6	3.5	5.4	0.3	2,265
Garden eggs	35.4	16.2	5.3	27.4	10.5	2.3	2.7	0.2	20,196
Lettuce	36.3	9.9	8.3	22.7	2.3	14.7	4.3	1.5	604
Stringed Beans	52.8	25.9	3.4	9.9	3.6	2.3	2.0	0.1	7,811
Okra	39.5	22.1	5.7	20.1	6.5	2.8	3.0	0.3	37,305
Pepper (Sweet)	38.6	18.0	5.5	24.2	7.6	2.6	3.4	0.2	6,962
Cucumber	29.6	9.7	6.8	39.1	6.4	5.4	2.7	0.3	1,175
Spring Onions	32.3	17.7	7.6	21.5	2.2	13.6	3.8	1.3	316
Tomato	36.6	17.8	5.1	28.4	7.5	2.1	2.3	0.2	41,591
Onions	31.4	25.5	10.0	27.4	1.5	1.4	2.5	0.2	6,646
Shallots	18.3	27.2	2.2	48.6	0.3	0.6	2.8	-	360
Female	24,584	14,586	4,044	8,072	2,612	2,287	2,117	194	
Total	42.0	24.9	6.9	13.8	4.5	3.9	3.6	0.3	58,496
Asian vegetables	100.0	-	-	-	-	-	-	-	2
Cabbage	38.5	15.9	4.5	30.0	5.3	3.6	2.2	0.2	647
Carrots	31.0	15.0	11.8	33.8	1.0	3.8	3.5	-	287
Garden eggs	39.4	21.7	6.7	16.7	7.0	4.1	4.2	0.3	8,018
Lettuce	36.2	21.5	3.8	30.0	0.8	4.6	2.3	0.8	130
Stringed Beans	39.7	25.4	4.3	14.2	5.0	3.7	7.2	0.4	1,453
Okra	44.0	28.4	7.3	9.1	3.0	4.4	3.3	0.4	27,385
Pepper (Sweet)	45.2	24.2	5.3	13.2	4.7	3.0	4.4	0.2	3,009
Cucumber	31.0	12.3	8.4	35.0	7.9	2.0	2.5	1.0	203
Spring Onions	34.0	30.2	1.9	15.1	-	13.2	1.9	3.8	53
Tomato	40.1	21.6	6.5	18.3	6.0	3.5	3.6	0.3	15,356
Onions	41.5	22.0	10.0	20.4	2.4	1.2	2.2	0.4	1,899
Shallots	20.4	40.7	1.9	31.5	-	3.7	1.9	-	54

8.4.7 Land tenure arrangements of parcels for Industrial crop holders

Ownership by freehold and inheritance of parcels is the dominant (74.7%) form of tenure arrangement for industrial crop as well as ornamental crop holders. Kenaf cultivation is exclusively by holders (96.2%) who own their parcels by either freehold or inheritance.

The most preferred tenure arrangement for the cultivation of rubber is share-cropping for males as well as for females (11.7% and 9.1% respectively). Also, sugar cane and tobacco cultivation under rent tenure arrangements constitute 15.4 percent and 8.3 percent respectively. The proportion of female holders cultivating tobacco under renting arrangement is 15.5 percent (Table 8.27).

Table 8.27: Industrial crop holders 15 years or older by type of crop and sex, and by type of land tenure arrangement

Type of crop	Own/free holding	Inheritance	Leasehold	Renting	Share-cropping	Squatting	Trusteeship	Other	Total
Both sexes	4,064	3,739	498	1,148	588	198	196	7	14,242
Total	44.2	30.5	5.8	8.7	7.2	1.5	2.1	0.1	
Citronella	53.7	31.5	3.7	3.7	5.6	-	1.9	-	54
Cotton	68.3	28.6	1.0	1.0	0.3	0.5	0.3	-	1,456
Jute	50.0	50.0	-	-	-	-	-	-	8
Kenaf	17.7	78.5	2.0	0.6	0.4	0.3	0.4	0.1	961
Rubber	58.6	15.8	8.8	2.5	11.4	0.2	2.5	0.1	3,804
Sisal	60.5	31.5	3.6	3.0	-	0.6	0.9	-	337
sweet berry	44.4	22.2	-	22.2	-	11.1	-	-	9
Sugar Cane	33.5	32.0	5.5	15.4	8.4	2.5	2.6	0.1	6,806
Tobacco	46.4	32.5	9.9	8.3	0.4	1.5	1.0	-	787
Sunflowers	50.0	33.3	16.7	-	-	-	-	-	6
Seri-culture	71.4	7.1	-	-	7.1	7.1	7.1	-	14
Ornamentals*	45.6	29.1	3.5	12.7	4.3	2.9	1.5	0.5	1387
Male	3,387	2,834	403	890	491	158	163	4	11,652
Total	45.7	28.7	6.1	8.4	7.6	1.4	2.1	0.1	
Citronella	61.1	22.2	5.6	2.8	5.6	-	2.8	-	36
Cotton	68.6	28.4	1.0	1.0	0.3	0.5	0.3	-	1,431
Jute	33.3	66.7	-	-	-	-	-	-	3
Kenaf	13.8	81.6	2.5	0.8	0.3	0.5	0.5	-	636
Rubber	58.2	15.4	9.2	2.6	11.7	0.2	2.6	0.1	3,322
Sisal	73.4	24.5	0.8	0.4	-	-	0.8	-	237
Sweet berry	50.0	16.7	-	16.7	-	16.7	-	-	6
Sugar Cane	33.9	30.6	5.5	15.5	9.1	2.6	2.7	0.1	5,284
Tobacco	46.8	32.3	11.1	7.2	0.3	1.3	1.0	-	684
Sunflowers	33.3	66.7	-	-	-	-	-	-	3
Seri-culture	60.0	10.0	-	-	10.0	10.0	10.0	-	10
Ornamentals*	44.0	31.9	3.3	12.3	4.3	2.5	1.1	0.5	1024
Female	677	905	95	258	97	40	33	3	2,590
Total	37.5	38.4	4.8	10.3	5.4	1.7	1.7	0.1	
Citronella	38.9	50.0	-	5.6	5.6	-	-	-	18
Cotton	52.0	40.0	-	-	4.0	4.0	-	-	25
Jute	60.0	40.0	-	-	-	-	-	-	5
Kenaf	25.2	72.3	0.9	0.3	0.6	-	0.3	0.3	325
Rubber	61.2	18.7	6.0	1.9	9.1	0.8	2.3	-	482
Sisal	30.0	48.0	10.0	9.0	-	2.0	1.0	-	100
Sweet berry	33.3	33.3	-	33.3	-	-	-	-	3
Sugar Cane	32.2	37.1	5.2	15.1	6.0	2.2	2.0	0.1	1,522
Tobacco	43.7	34.0	1.9	15.5	1.0	2.9	1.0	-	103
Sunflowers	66.7	-	33.3	-	-	-	-	-	3
Seri-culture	100.0	-	-	-	-	-	-	-	4
Ornamentals*	50.1	20.9	3.9	13.8	4.1	3.9	2.8	0.6	363

*Ornamental crops are not industrial crops but are presented here for convenience

8.5 Land size used for arable crop farming

Production of arable crops is predominantly small-scale with about 70 percent of holders cultivating on land parcels less than or equal to 2 acres in size. Only about one in ten parcels (8.8%) are of sizes greater than 5 acres.

With the exception of leafy vegetables, the proportion of parcels used in the cultivation of arable crops decreases for larger parcels of land. For all crops, less than 3 percent of cultivation is on parcels of land larger than 10 acres while for leafy vegetables, about 5 percent of the production is on parcels of land larger than 10 acres (Table 8.28).

Table 8.28: Land parcels for agriculture by size (acres), and type of arable crop

<u>Land size</u>	<u>Starchy staples</u>	<u>Pulses and legum</u>	<u>Herbs, spices and condiments</u>	<u>Horticulture</u>	<u>Leafy vegetables</u>	<u>Non-leafy vegetables</u>	<u>Industrial crops</u>	<u>Total</u>
All sizes	3,245,064	471,636	121,612	15,078	4,292	195,155	12,258	4,065,095
Total	79.8	11.6	3.0	0.4	0.1	4.8	0.3	
<=2	68.0	69.9	78.9	64.4	85.4	78.7	80.2	69.1
>2 - <= 5	22.7	22.6	15.5	25.0	8.0	15.0	13.8	22.0
>5 - <=10	6.9	5.5	3.6	7.6	1.8	3.5	3.4	6.4
10+	2.4	2.0	2.0	3.1	4.9	2.8	2.6	2.4

On average, 69.3 percent of holders cultivating arable crops and practising mono-cropping have parcels of land that are less than or equal to 2 acres in size while 21.9 percent cultivate on parcels greater than 2 acres but less than 5 acres in size. Only 2.7 percent of holders cultivate on parcels that are greater than 10 acres.

For the specific type of arable crop cultivated using mono-cropping, eight out of every ten holders who grow leafy vegetables (87.2%), herbs and spices (86.1%), non-leafy vegetables (83.2%) and industrial crops (81.3%) use parcels that are less than or equal to 2 acres whereas the highest proportion of holders using parcels that are more than 10 acres cultivate leafy vegetables (6.4%).

Majority of arable crop holders who practice mixed-cropping also used parcels that are less than 2 acres, similar to holders who practice mono-cropping. Eight out of every ten holders growing leafy vegetables used parcels less than 2 acres while 5.0 percent of holders cultivating horticultural crops used parcels that are more than 10 acres. (Table 8.29).

Table 8.29: Land parcels for agriculture by type of cropping system and size (acres), and by type of arable crop

<u>Land size</u>	<u>Starchy staples</u>	<u>Pulses and legumes</u>	<u>Herbs, spices and condiments</u>	<u>Horticulture</u>	<u>Leafy vegetables</u>	<u>Non-leafy vegetables</u>	<u>Industrial crops</u>	<u>Total</u>
Mono-cropping	1,250,690	266,333	61,979	10,991	1,286	92,509	8,995	1,692,783
Total	73.9	15.7	3.7	0.6	0.1	5.5	0.5	
<=2	66.2	74.8	86.1	68.4	87.2	83.2	81.3	69.3
>2 - <= 5	23.7	20.0	10.4	23.5	4.6	11.4	12.7	21.9
>5 - <=10	7.0	3.8	1.9	5.7	1.8	2.0	3.2	6.0
10+	3.0	1.4	1.7	2.3	6.4	3.3	2.8	2.7
Mixed-cropping	1,994,374	205,303	59,633	4,087	3,006	102,646	3,263	2,372,312
Total	84.1	8.7	2.5	0.2	0.1	4.3	0.1	
<=2	69.2	63.6	71.4	53.6	84.6	74.7	76.9	69.0
>2 - <= 5	22.0	25.9	20.9	28.8	9.4	18.2	16.9	22.1
>5 - <=10	6.8	7.6	5.5	12.6	1.8	4.8	4.1	6.7
10+	2.1	2.9	2.3	5.0	4.2	2.4	2.1	2.2

8.6 Arable crops and use of fertilizer, pesticide, protective cover and irrigation

Out of the 3,876,778 holders¹⁰, more than 72.0 percent of holders¹¹ who cultivate arable crops do not use fertilizer. More than two-thirds of those who cultivate pulses/legumes (83.4%), industrial crops (78.3%), starchy staples (74.3%) and leafy vegetables (67.7%) do not use fertilizer. The types of arable crops for which majority of holders use fertilizer are horticulture (67.4%), non-leafy vegetables (58.3%), and herbs/spices/condiments (50.1%). Under the mono-cropping system, the types of crops for which majority of holders use fertilizer are horticulture (69.2%), non-leafy vegetables (67.1%) and herbs/spices/condiments (54.2%). For mixed-cropping, fertilizer use is again the highest among holders who cultivate horticultural crops (62.6%) and non-leafy vegetables (50.6%), see Table 8.30.

Generally, the use of pesticides is more common than that of fertilizer among all arable crop holders. About two-thirds (66.2%) of holders use pesticides with eight in ten holders who cultivate non-leafy vegetables (82.9%), horticulture (81.8%) and herbs/spices/condiments (80.5%) use pesticides. For mono-cropping, eight in every ten holders who cultivate non-leafy vegetables (86.6%) and horticultural crops (82.7%) use pesticides and for mixed-cropping, eight in every ten holders who grow herbs (81.1%) and non-leafy vegetables (80.0%).

The use of irrigation is not common in the cultivation of arable crops. Only 6.1 percent of arable crop holders use irrigation in cultivating crops. The type of arable crops for which the use of irrigation is more common are non-leafy vegetables (31.4%), leafy vegetables (25.2%) and industrial crops (19.7%). Under mono-cropping, the type of crops for which more than one third of holders use irrigation are leafy vegetables (37.6%) and non-leafy vegetables (37.0%). In the case of mixed-cropping, more than one-quarter of holders in industrial crops (29.5%) and non-leafy vegetables (26.5%) use irrigation.

The use of protective cover is not a common practice in the cultivation of arable crops. Almost all arable crop holders (98.0%) do not use protective cover. However, the use of protective cover is relatively higher in the cultivation of non-leafy vegetables (4.9%), leafy vegetables (4.6%), horticultural crops (4.5%) and herb/spices (4.5%) compared to the other arable crops. For mono and mixed-cropping, the use of protective cover is about 7 percent among holders who cultivate leafy vegetables (6.9%) and horticultural crops (6.5%) respectively (Table 8.30).

¹⁰ There are 2,158,697 holders with multiple cases of fertilizer usage totaling 3,876,778 holders.

¹¹ The demoninator of holders is a multiple count of holders because some holders cultivated more than one crop.

Table 8.30: Arable crop holders 15 years or older by type of cropping system and type of crop, and by use of fertilizer, pesticide, irrigation and protective cover

Type of arable crops and cropping system	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Both cropping systems	1,052,613	2,824,165	2,566,850	1,309,928	235,395	3,641,383	81,801	3,794,977	3,876,778
Total	27.2	72.8	66.2	33.8	6.1	93.9	2.1	97.9	
Starchy staples	25.7	74.3	66.1	33.9	4.4	95.6	1.9	98.1	3,076,602
Pulses/legumes	16.6	83.4	55.8	44.2	2.5	97.5	1.6	98.4	460,681
Herbs/spices	50.1	49.9	80.5	19.5	19.0	81.0	4.5	95.5	118,557
Horticulture	67.4	32.6	81.8	18.2	18.8	81.2	4.5	95.5	14,473
Leafy vegetables	32.3	67.7	53.8	46.2	25.2	74.8	4.6	95.4	4,206
Non-leafy vegetables	58.3	41.7	82.9	17.1	31.4	68.6	4.9	95.1	190,434
Industrial crops	21.7	78.3	64.0	36.0	19.7	80.3	3.5	96.5	11,825
Mono-cropping	580,670	1,020,680	1,089,296	512,054	98,054	1,503,296	38,394	1,562,956	1,601,350
Total	36.3	63.7	68.0	32.0	6.1	93.9	2.4	97.6	
Starchy staples	39.4	60.6	67.7	32.3	3.9	96.1	2.4	97.6	1,171,892
Pulses/legumes	6.5	93.5	60.0	40.0	1.7	98.3	1.4	98.6	259,637
Herbs/spices	54.2	45.8	79.9	20.1	18.0	82.0	4.1	95.9	59,985
Horticulture	69.2	30.8	82.7	17.3	17.0	83.0	3.8	96.2	10,493
Leafy vegetables	38.1	61.9	61.2	38.8	37.6	62.4	6.9	93.1	1,254
Non-leafy vegetables	67.1	32.9	86.2	13.8	37.0	63.0	4.2	95.8	89,493
Industrial crops	21.5	78.5	69.0	31.0	16.1	83.9	3.4	96.6	8,596
Mixed-cropping	471,943	1,803,485	1,477,554	797,874	137,341	2,138,087	43,407	2,232,021	2,275,428
Total	20.7	79.3	64.9	35.1	6.0	94.0	1.9	98.1	
Starchy staples	17.4	82.6	65.2	34.8	4.7	95.3	1.6	98.4	1,904,710
Pulses/legumes	29.5	70.5	50.4	49.6	3.4	96.6	1.9	98.1	201,044
Herbs/spices	46.0	54.0	81.1	18.9	20.1	79.9	4.8	95.2	58,572
Horticulture	62.6	37.4	79.5	20.5	23.6	76.4	6.5	93.5	3,980
Leafy vegetables	29.8	70.2	50.7	49.3	19.9	80.1	3.7	96.3	2,952
Non-leafy vegetables	50.6	49.4	80.0	20.0	26.5	73.5	5.5	94.5	100,941
Industrial crops	22.1	77.9	50.7	49.3	29.5	70.5	3.9	96.1	3,229

More holders in urban areas (29.2%) use fertilizer than those in rural areas (26.6%). Among holders in urban areas, crops for which majority of holders use fertilizer are non-leafy vegetables (65.5%), horticultural crops (62.4%) and herbs/spices (52.4%). In rural areas, holders of horticultural (68.8%) and non-leafy vegetables (56.0%) crops are the main users of fertilizer (Table 8.31).

About 69.0 percent of holders in urban areas use pesticides compared to 65.6 percent of holders in rural areas. Crops for which more than two-thirds of holders in urban areas use pesticides are non-leafy vegetables (83.9%), herbs/spices (79.4%), horticultural crops (79.0%), pulses/legumes (68.9%) and starchy staples (67.3%). For holders in rural areas, the types of crops for which less than two-thirds of holders use pesticides are starchy staples (65.8%), pulses/legumes (54.0%) and leafy vegetables (55.6%).

The use of irrigation is generally low among holders in both urban and rural areas. However, it is higher for urban (8.2%) than for rural (5.6%) holders. In urban areas, more than one-quarter of holders who are cultivating non-leafy vegetables (43.6%), leafy vegetables (34.7%) and herbs/spices (26.7%) use irrigation. Except for non-leafy vegetables (27.4%) where slightly more than a quarter of holders use irrigation in rural areas, less than 21 percent of holders use irrigation in the cultivation of their crops.

The use of protective cover is generally very low in urban and rural areas with less than 8 percent in urban area and less than 5 percent in rural areas (Table 8.31).

Table 8.31: Arable crop holders 15 years or older by type of locality and type of crop, and by use of fertilizer, pesticide, irrigation and protective cover

Type of locality and crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Urban	224,802	544,777	529,211	240,368	62,776	706,803	19,626	749,953	769,579
Starchy staples	26.1	73.9	67.3	32.7	5.2	94.8	2.2	97.8	635,734
Pulses/legumes	23.3	76.7	68.9	31.1	2.9	97.1	2.9	97.1	56,728
Herbs/spices	52.4	47.6	79.4	20.6	26.7	73.3	4.4	95.6	23,393
Horticulture	62.4	37.6	79.0	21.0	16.8	83.2	3.7	96.3	3,082
Leafy vegetables	32.2	67.8	50.3	49.7	34.7	65.3	7.6	92.4	1,429
Non-leafy vegetables	65.5	34.5	83.9	16.1	43.6	56.4	5.6	94.4	47,263
Industrial crops	11.6	88.4	46.9	53.1	17.4	82.6	2.2	97.8	1,950
Rural	827,811	2,279,388	2,037,639	1,069,560	172,619	2,934,580	62,175	3,045,024	3,107,199
Starchy staples	25.7	74.3	65.8	34.2	4.2	95.8	1.8	98.2	2,440,868
Pulses/legumes	15.6	84.4	54.0	46.0	2.4	97.6	1.5	98.5	403,953
Herbs/spices	49.6	50.4	80.8	19.2	17.1	82.9	4.5	95.5	95,164
Horticulture	68.8	31.2	82.6	17.4	19.3	80.7	4.8	95.2	11,391
Leafy vegetables	32.4	67.6	55.6	44.4	20.3	79.7	3.1	96.9	2,777
Non-leafy vegetables	56.0	44.0	82.6	17.4	27.4	72.6	4.7	95.3	143,171
Industrial crops	23.7	76.3	67.4	32.6	20.2	79.8	3.8	96.2	9,875

8.6.1 Starchy staple crops and use of selected inputs

Starchy staple crops for which higher proportion of holders use fertilizer are rice (53.9%) and maize (46.9%). Less than 10 percent of the holders in the cultivation of cocoyam (6.3%), plantain (7.3%), yam (9.0%) and cassava (9.9%), use fertilizer. More males (28.6%) than females (17.7%) use fertilizer in the cultivation of starchy staple crops. Slightly more than 50 percent of male holders use fertilizer in the production of rice (52.7%) and maize (51.1%) while for females, only holders in the production of rice using fertilizer exceed 50 percent (Table 8.32).

About two-thirds of starchy staple holders use pesticides and the specific crops for which more than two-thirds of holders use pesticides are maize (75.3%), rice (74.3%) and yam (73.9%). Starchy staple crops for which at least two-thirds of male holders use pesticides are rice (78.1%), taro (77.0%) and cassava (68.0%). Female holders who cultivate maize use pesticides, constituting more than two-thirds (69.5%) of the proportion using pesticides.

For each of the starchy staples, less than 10 percent of holders use irrigation. The highest proportion of starchy staple holders who use irrigation are those who cultivate sweet potato (8.1%) followed by holders who cultivate taro (6.9%). A slightly higher proportion of females (4.7%) use irrigation than males (4.3%). Among male holders, crops for which at least 5 percent use irrigation are sweet potato (8.1%), maize (7.7%), rice (7.7%) and plantain (5.4%). In the case of females, the proportion of holders of five crops – sweet potato (8.3%), rice (6.6%), taro (5.6%), plantain (5.1%) and cassava (5.0%) – is 5 percent or more. The proportion of holders who use protective cover in the cultivation of starchy staples is less than 2.0 percent. More males (2.0%) than females (1.6%) use protective cover in the cultivation of starchy staples. At least 3.0 percent of holders who cultivate rice (3.1%) and sweet potato (3.2%) use protective cover in cultivating these crops (Table 8.32).

Table 8.32: Starchy staple crop holders 15 years or older by sex and type of starchy staple crop, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Both Sexes	792,114	2,284,488	2,034,710	1,041,892	135,499	2,941,103	58,403	3,018,199	3,076,602
Total	25.7	74.3	66.1	33.9	4.4	95.6	1.9	98.1	
Maize	46.9	53.1	75.3	24.7	4.3	95.7	2.3	97.7	1,058,881
Rice	53.9	46.1	74.3	25.7	7.5	92.5	3.1	96.9	156,768
Millet	27.9	72.1	39.3	60.7	2.4	97.6	2.7	97.3	186,080
Sorghum	22.6	77.4	37.3	62.7	2.4	97.6	1.1	98.9	85,694
Cassava	9.9	90.1	64.7	35.3	4.9	95.1	1.4	98.6	732,689
Yam	9.0	91.0	73.9	26.1	2.2	97.8	1.9	98.1	277,988
Cocoyam	6.3	93.7	55.3	44.7	4.2	95.8	1.3	98.7	149,543
Taro	12.2	87.8	57.1	42.9	6.9	93.1	1.8	98.2	606
Sweet Potato	25.4	74.6	63.2	36.8	8.1	91.9	3.2	96.8	8,902
Plantain	7.3	92.7	59.0	41.0	5.3	94.7	1.4	98.6	419,451
Male	650,693	1,628,401	1,564,603	714,491	97,918	2,181,176	45,895	2,233,199	2,279,094
Total	28.6	71.4	68.7	31.3	4.3	95.7	2.0	98.0	
Maize	51.1	48.9	77.0	23.0	4.2	95.8	2.4	97.6	823,081
Rice	52.7	47.3	78.1	21.9	7.7	92.3	3.2	96.8	119,311
Millet	29.1	70.9	42.2	57.8	2.4	97.6	2.9	97.1	157,924
Sorghum	23.7	76.3	39.7	60.3	2.6	97.4	1.1	98.9	73,622
Cassava	10.7	89.3	68.0	32.0	4.8	95.2	1.4	98.6	489,401
Yam	9.0	91.0	75.9	24.1	2.1	97.9	2.0	98.0	241,803
Cocoyam	7.1	92.9	58.0	42.0	4.2	95.8	1.2	98.8	94,831
Taro	11.7	88.3	58.7	41.3	7.7	92.3	2.3	97.7	392
Sweet Potato	28.4	71.6	62.4	37.6	8.1	91.9	3.6	96.4	6,869
Plantain	7.9	92.1	61.1	38.9	5.4	94.6	1.4	98.6	271,860
Female	141,421	656,087	470,107	327,401	37,581	759,927	12,508	785,000	797,508
Total	17.7	82.3	58.9	41.1	4.7	95.3	1.6	98.4	
Maize	32.4	67.6	69.5	30.5	4.7	95.3	1.8	98.2	235,800
Rice	57.7	42.3	61.9	38.1	6.6	93.4	2.9	97.1	37,457
Millet	21.1	78.9	22.7	77.3	2.3	97.7	1.5	98.5	28,156
Sorghum	16.0	84.0	22.9	77.1	1.6	98.4	1.1	98.9	12,072
Cassava	8.4	91.6	58.1	41.9	5.0	95.0	1.3	98.7	243,288
Yam	8.8	91.2	60.8	39.2	2.9	97.1	1.5	98.5	36,185
Cocoyam	5.0	95.0	50.7	49.3	4.2	95.8	1.3	98.7	54,712
Taro	13.1	86.9	54.2	45.8	5.6	94.4	0.9	99.1	214
Sweet Potato	15.1	84.9	65.9	34.1	8.3	91.7	1.7	98.3	2,033
Plantain	6.1	93.9	55.0	45.0	5.1	94.9	1.3	98.7	147,591

8.6.2 Pulses/legumes and use of selected inputs

Generally, less than one-fifth of holders (16.6%) who cultivate pulses/legumes use fertilizer. More than one-third (37.8%) of holders in the cultivation of soya beans use fertilizer. This is followed distantly by holders who produce cowpea (18.7%). More males (17.3%) than females (14.7%) use fertilizer in the cultivation of pulses/legumes. Male holders who cultivate soya beans (35.3%) and cowpea (19.1%) have higher proportions. A similar pattern is observed among female holders, where fertilizer used is higher among soya beans (45.7%) and cowpea (16.9%) holders.

A slightly higher proportion of males (56.6%) than females (53.8%) use pesticides in the cultivation of pulses/legumes. More than three-quarters of holders in the cultivation of pigeon pea (79.4%) and cowpea (76.5%) use pesticides. Among male holders, the crops for which more than two-thirds use pesticides are pigeon pea (81.3%), cowpea (78.0%) and soya bean (66.7%) and for females, pigeon peas (72.3%) and cowpea (69.8%).

The use of irrigation and protective cover in the cultivation of pulses/legumes crops by holders are negligible with only 2.5 percent using irrigation and 1.6 percent using protective cover. A similar pattern is observed for males and females (Table 8.33).

Table 8.33: Pulses and legumes holders 15 years or older by sex and type of pulses/legumes crop, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Both Sexes	76,313	384,368	257,111	203,570	11,403	449,278	7,515	453,166	460,681
Total	16.6	83.4	55.8	44.2	2.5	97.5	1.6	98.4	
Bambara beans	11.2	88.8	28.8	71.2	3.2	96.8	2.0	98.0	45,574
Cowpeas	18.7	81.3	76.5	23.5	2.7	97.3	1.5	98.5	81,086
Groundnuts	11.3	88.7	51.9	48.1	2.4	97.6	1.4	98.6	261,721
Pigeon peas	8.3	91.7	79.4	20.6	0.7	99.3	0.6	99.4	2,990
Soya bean	37.8	62.2	63.0	37.0	2.1	97.9	2.5	97.5	69,310
Total	57,302	273,869	187,385	143,786	8,738	322,433	5,871	325,300	331,171
Male	17.3	82.7	56.6	43.4	2.6	97.4	1.8	98.2	
Bambara beans	11.7	88.3	29.9	70.1	3.9	96.1	2.4	97.6	31,086
Cowpeas	19.1	80.9	78.0	22.0	2.8	97.2	1.5	98.5	65,869
Groundnuts	12.4	87.6	50.0	50.0	2.6	97.4	1.5	98.5	179,240
Pigeon peas	8.8	91.2	81.3	18.7	0.7	99.3	0.5	99.5	2,376
Soya bean	35.3	64.7	66.7	33.3	2.0	98.0	2.7	97.3	52,600
Total	19,011	110,499	69,726	59,784	2,665	126,845	1,644	127,866	129,510
Female	14.7	85.3	53.8	46.2	2.1	97.9	1.3	98.7	
Bambara beans	9.9	90.1	26.5	73.5	1.9	98.1	1.0	99.0	14,488
Cowpeas	16.9	83.1	69.8	30.2	2.3	97.7	1.4	98.6	15,217
Groundnuts	8.9	91.1	56.1	43.9	2.0	98.0	1.2	98.8	82,481
Pigeon peas	6.4	93.6	72.3	27.7	1.0	99.0	0.8	99.2	614
Soya bean	45.7	54.3	51.2	48.8	2.5	97.5	1.9	98.1	16,710

8.6.3 Herbs/spices crops and use of selected inputs

About half (50.1%) of holders producing herbs/spices/condiments crops use fertilizer. At least 40 percent of holders cultivating hot pepper (53.6%) and black pepper (44.7%) use fertilizer. For male holders, fertilizer is used for cultivating hot pepper (58.1%) and black pepper (48.5%) while female holders only use fertilizer for hot pepper (47.4%). The use of fertilizer for the cultivation of melon seeds is very rare (9.3%) (Table 8.34).

Four out of five (80.5%) holders of herbs/spices crops use pesticides. Hot pepper (81.4%), black pepper (79.7%) and ginger (76.2%) are crops for which at least three-quarters of holders use pesticides. The crops for which more male holders use pesticides are hot pepper (84.2%), black pepper (80.9%), melon seeds (74.2%) and ginger (77.0%) and for females, black pepper (77.8%), hot pepper (77.4%) and ginger (73.8%) are the crops for which pesticides are used the most.

About one-fifth (19.0%) of holders who cultivate herbs/spices crops use irrigation. Melon seeds (0.6%) and nutmeg (1.6%) are crops for which less than 2 percent of holders use irrigation. More male (21.9%) than female (14.7%) holders of herbs/spices crops use irrigation. No male holder cultivating nutmeg uses irrigation and only 0.6 percent of male holders use irrigation in the cultivation of melon seed. Similarly, 0.6 percent of female holders producing melon seed use irrigation. Only 4.5 percent herbs/spices holders use protective cover. Among the holders of herbs/spices the use of protective cover ranges from total absence (ginger) to 12.9 percent (garlic).

Overall, a higher proportion of males use protective cover than females (4.9% compared to 3.8% respectively), in the cultivation of all types of herbs/spices, except for ginger. In the cultivation of nutmeg, males and females alike do not use any protective cover (Table 8.34).

Table 8.34: Herbs and spices holders 15 years or older by sex and type of herbs/spices, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Total	59,419	59,138	95,442	23,115	22,545	96,012	5,280	113,277	118,557
Both Sexes	50.1	49.9	80.5	19.5	19.0	81.0	4.5	95.5	
Black pepper	44.7	55.3	79.7	20.3	19.6	80.4	4.4	95.6	2,450
Ginger	27.4	72.6	76.2	23.8	7.0	93.0	2.8	97.2	8,458
Nutmeg	27.6	72.4	47.2	52.8	1.6	98.4	0.0	100.0	123
Garlic	32.3	67.7	58.1	41.9	19.4	80.6	12.9	87.1	31
Pepper (Hot)	53.6	46.4	81.4	18.6	20.7	79.3	4.7	95.3	103,744
Melon Seeds(Agusi)	9.3	90.7	69.5	30.5	0.6	99.4	1.0	99.0	3,621
Other Herbs & Species	20.0	80.0	40.0	60.0	14.3	85.7	2.9	97.1	70
Dandelion	18.3	81.7	41.7	58.3	11.7	88.3	3.3	96.7	60
Total	37,531	33,135	58,694	11,972	15,487	55,179	3,446	67,220	70,666
Male	53.1	46.9	83.1	16.9	21.9	78.1	4.9	95.1	
Black pepper	48.5	51.5	80.9	19.1	24.3	75.7	4.7	95.3	1,532
Ginger	25.0	75.0	77.0	23.0	6.8	93.2	2.7	97.3	6,301
Nutmeg	20.0	80.0	47.7	52.3	0.0	100.0	0.0	100.0	65
Garlic	30.0	70.0	65.0	35.0	20.0	80.0	20.0	80.0	20
Pepper (Hot)	58.1	41.9	84.2	15.8	24.3	75.7	5.3	94.7	60,285
Melon Seeds(Agusi)	6.3	93.7	74.2	25.8	0.6	99.4	1.4	98.6	2,367
Other Herbs & Species	27.5	72.5	47.1	52.9	15.7	84.3	3.9	96.1	51
Dandelion	24.4	75.6	46.7	53.3	13.3	86.7	4.4	95.6	45
Total	21,888.0	26,003.0	36,748.0	11,143.0	7,058.0	40,833.0	1,834.0	46,057.0	47,891
Female	45.7	54.3	76.7	23.3	14.7	85.3	3.8	96.2	
Black pepper	38.2	61.8	77.8	22.2	11.8	88.2	4.0	96.0	918
Ginger	34.5	65.5	73.8	26.2	7.6	92.4	3.4	96.6	2,157
Nutmeg	36.2	63.8	46.6	53.4	3.4	96.6	0.0	100.0	58
Garlic	36.4	63.6	45.5	54.5	18.2	81.8	0.0	100.0	11
Pepper (Hot)	47.4	52.6	77.4	22.6	15.6	84.4	4.0	96.0	43,459
Melon Seeds(Agusi)	15.0	85.0	60.8	39.2	0.6	99.4	0.2	99.8	1,254
Other Herbs & Species	0.0	100.0	21.1	78.9	10.5	89.5	0.0	100.0	19
Dandelion	0.0	100.0	26.7	73.3	6.7	93.3	0.0	100.0	15

8.6.4 Horticultural crops and use of selected inputs

About two-thirds of holders who cultivate horticultural crops use fertilizer. The proportion of holders who use fertilizer exceeds the average in the cultivation of only two crops—watermelon (73.6%) and butternut squash (73.5%). The use of fertilizer is generally higher among males than females in the cultivation of horticultural crops. The exceptions are watermelon, butternut squash and pineapple. For male holders, the proportion that use fertilizer in the cultivation of watermelon (73.5%), butternut squash (72.2%) and pineapple (67.7%) exceeds two-thirds compared to their female counterparts—butternut squash (81.8%), watermelon (74.1%) and passion fruits (71.4%), see Table 8.35. About 82.0 percent of horticultural crop holders use pesticides. Watermelon (91.6%), butternut squash (85.5%) and pineapple (80.2%) are crops for which at least four-fifths of holders use pesticides in cultivating. More males (83.3%) than females (72.7%) use pesticides. Among male holders, watermelon (91.9%), butternut squash (84.7%) and pineapple (82.5%) are crops for which more than four-fifths use pesticides. For female holders, the crops for which more than four-fifth use pesticides are butternut squash (90.9%), watermelon (89.7%) and passion fruits (85.7%).

Less than one-fifth of horticultural crop holders use irrigation with higher usage among both males and females. The use of irrigation for the cultivation of tiger nuts (4.0%), soursop (10.3%) and watermelon (14.8%) is the lowest. The pattern is similar for male and female holders. However, for females who cultivate sweetsop, the proportion that use irrigation is 12.5 percent while no female holder uses irrigation in the cultivation of soursop.

There is limited use of protective cover in the cultivation of horticultural crops. Only 4.5 percent of holders use protective cover and this practice is mostly among holders who cultivate flowers (13.6%) and sweetsop (13.0%). For male holders, the practice is consistent with the general pattern as the use of protective cover is mostly among holders who cultivate flowers (10.3%) and sweetsop (16.7%). However, for female holders, the use of protective cover is mostly among those who cultivate flowers (10.3%) and passion fruits (14.3%), see Table 8.35.

Table 8.35: Horticultural crop holders 15 years or older by sex and type of horticultural crop, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Total	9,754	4,719	11,842	2,631	2,721	11,752	657	13,816	14,473
Both Sexes	67.4	32.6	81.8	18.2	18.8	81.2	4.5	95.5	
Flowers	13.6	86.4	34.1	65.9	25.0	75.0	13.6	86.4	44
Pineapples	65.0	35.0	80.2	19.8	22.9	77.1	5.9	94.1	7,737
Watermelon	73.6	26.4	91.6	8.4	14.8	85.2	3.1	96.9	5,604
Passion Fruit	33.3	66.7	69.4	30.6	38.9	61.1	8.3	91.7	36
Sweetsop	32.6	67.4	56.5	43.5	30.4	69.6	13.0	87.0	46
Soursop	17.9	82.1	35.9	64.1	10.3	89.7	2.6	97.4	39
Butternut squash	73.5	26.5	85.5	14.5	43.4	56.6	3.6	96.4	83
Tiger nut	56.9	43.1	39.6	60.4	4.0	96.0	0.8	99.2	884
Total	8,625	3,774	10,334	2,065	2,379	10,020	575	11,824	12,399
Male	69.6	30.4	83.3	16.7	19.2	80.8	4.6	95.4	
Flowers	17.2	82.8	41.4	58.6	24.1	75.9	10.3	89.7	29
Pineapples	67.7	32.3	82.5	17.5	23.5	76.5	6.1	93.9	6,587
Watermelon	73.5	26.5	91.9	8.1	15.0	85.0	3.1	96.9	4,956
Passion Fruit	24.1	75.9	65.5	34.5	41.4	58.6	6.9	93.1	29
Sweetsop	36.7	63.3	56.7	43.3	40.0	60.0	16.7	83.3	30
Soursop	16.7	83.3	37.5	62.5	16.7	83.3	4.2	95.8	24
Butternut squash	72.2	27.8	84.7	15.3	40.3	59.7	2.8	97.2	72
Tiger nut	65.6	34.4	34.1	65.9	3.4	96.6	0.9	99.1	672
Total	1,129	945	1,508	566	342	1,732	82	1,992	2,074
Female	54.4	45.6	72.7	27.3	16.5	83.5	4.0	96.0	
Flowers	6.7	93.3	20.0	80.0	26.7	73.3	20.0	80.0	15
Pineapples	49.1	50.9	67.2	32.8	19.7	80.3	4.9	95.1	1,150
Watermelon	74.1	25.9	89.7	10.3	13.7	86.3	2.9	97.1	648
Passion Fruit	71.4	28.6	85.7	14.3	28.6	71.4	14.3	85.7	7
Sweetsop	25.0	75.0	56.3	43.8	12.5	87.5	6.3	93.8	16
Soursop	20.0	80.0	33.3	66.7	0.0	100.0	0.0	100.0	15
Butternut squash	81.8	18.2	90.9	9.1	63.6	36.4	9.1	90.9	11
Tiger nut	29.2	70.8	57.1	42.9	5.7	94.3	0.5	99.5	212

8.6.5 Leafy vegetable crops and use of selected inputs

About one-third (32.3%) of leafy vegetable crop holders use fertilizer. Crops for which the use of fertilizer is above the average (32.3%) are gboma (43.3%), pumpkin leaves (38.6%), ayoyo/ademe (34.6%) and spinach (33.7%). Among male holders, crops for which fertilizer use is above average (37.2%) are gboma (56.3%), spinach (48.0%) and ayoyo/ademe (38.8%). About a quarter of

female holders use fertilizer and the crops for which fertilizer use is above average (25.2%) are gboma, amaranthus, pumpkin leaves and ayoyo/ademe (Table 8.36).

More than half of leafy vegetable crop holders use pesticide, with higher proportions (more than two-thirds) among holders who cultivate gboma and ayoyo/ademe. This is true for male holders cultivating spinach, where a higher proportion of holders use pesticide, while for female holders, the proportion that use pesticide is less than two-thirds for all types of leafy vegetables. Only one in four (25.2%) leafy vegetable holders use irrigation in the cultivation of crops. The use is higher for male (27.8%) than for female (21.4%) holders. Furthermore, the use of irrigation is higher for males than females in the cultivation of other crops, except for amaranthus and moringa.

There is limited use of protective cover in the cultivation of leafy vegetables. Protective cover is least used in the cultivation of amaranthus (1.3%) and pumpkin leaves (0.5%). For male holders, protective cover is least used in the cultivation of pumpkin leaves while for females there is no use of any protective cover (Table 8.36).

8.6.6 Mushroom and use of selected inputs

Pesticides (33.1%), irrigation (39.0%) and protective cover (33.1%) are almost equally used by holders in the cultivation of mushroom. Fertilizer (16.1%) is less commonly used in the cultivation of mushroom. The use of these inputs is higher among female than among male holders (Table 8.36).

Table 8.36: Leafy vegetable holders 15 years or older by sex and by type of vegetable, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Total	1,359	2,847	2,263	1,943	1,059	3,147	194	4,012	4,206
Both Sexes	32.3	67.7	53.8	46.2	25.2	74.8	4.6	95.4	
Gboma	43.3	56.7	72.4	27.6	45.5	54.5	5.3	94.7	605
Bitter leaf	19.6	80.4	29.7	70.3	11.5	88.5	2.4	97.6	286
Amaranthus	29.5	70.5	64.1	35.9	25.0	75.0	1.3	98.7	156
Spinach	33.7	66.3	62.4	37.6	30.3	69.7	5.6	94.4	178
Pumpkin leaves	38.6	61.4	23.0	77.0	4.7	95.3	0.5	99.5	443
Moringa	8.9	91.1	37.0	63.0	10.3	89.7	3.4	96.6	146
Ayoyo/ Ademe	34.6	65.4	68.5	31.5	31.2	68.8	3.6	96.4	1,280
Other leafy vegetables	29.1	70.9	46.0	54.0	17.8	82.2	5.1	94.9	994
Mushroom*	16.1	83.9	33.1	66.9	39.0	61.0	33.1	66.9	118
Total	925	1,562	1,370	1,117	691	1,796	134	2,353	2,487
Male	37.2	62.8	55.1	44.9	27.8	72.2	5.4	94.6	
Gboma	56.3	43.7	80.5	19.5	57.1	42.9	6.1	93.9	343
Bitter leaf	25.9	74.1	29.1	70.9	12.7	87.3	2.1	97.9	189
Amaranthus	25.6	74.4	62.8	37.2	21.8	78.2	2.6	97.4	78
Spinach	48.0	52.0	71.4	28.6	37.8	62.2	8.2	91.8	98
Pumpkin leaves	45.2	54.8	17.8	82.2	5.1	94.9	0.7	99.3	292
Moringa	9.6	90.4	37.5	62.5	8.7	91.3	2.9	97.1	104
Ayoyo/ Ademe	38.8	61.2	72.6	27.4	34.5	65.5	4.1	95.9	658
other leafy vegetables	32.3	67.7	50.8	49.2	20.8	79.2	6.2	93.8	634
Mushroom*	15.4	84.6	31.9	68.1	37.4	62.6	30.8	69.2	91
Total	434	1,285	893	826	368	1,351	60	1,659	1,719
Female	25.2	74.8	51.9	48.1	21.4	78.6	3.5	96.5	
Gboma	26.3	73.7	61.8	38.2	30.2	69.8	4.2	95.8	262
Bitter leaf	7.2	92.8	30.9	69.1	9.3	90.7	3.1	96.9	97
Amaranthus	33.3	66.7	65.4	34.6	28.2	71.8	0.0	100.0	78
Spinach	16.3	83.8	51.3	48.8	21.3	78.8	2.5	97.5	80
Pumpkin leaves	25.8	74.2	33.1	66.9	4.0	96.0	0.0	100.0	151
Moringa	7.1	92.9	35.7	64.3	14.3	85.7	4.8	95.2	42
Ayoyo/ Ademe	30.2	69.8	64.1	35.9	27.7	72.3	3.1	96.9	622
other leafy vegetables	23.3	76.7	37.5	62.5	12.5	87.5	3.3	96.7	360
Mushroom*	18.5	81.5	37.0	63.0	44.4	55.6	40.7	59.3	27

* Mushroom is a fungus but is presented here for convenience.

8.6.7 Non-leafy vegetable crops and use of selected inputs

Majority of non-leafy vegetable crop holders (58.3%) use fertilizer. The proportion of holders who use fertilizer is at least 65 percent for all types of non-leafy vegetable crops except for the cultivation of okra (39.6%) and string beans (19.4%). The use of fertilizer by males (64.7%) is significantly higher than females by about 20 percentage points. Fertilizer use for the cultivation of shallots (97.8%) and onions (90.9%) is highest among male holders.

About 83.0 percent of non-leafy vegetable holders use pesticide, and the crops for which nine in ten use pesticides are cabbage (92.7%), shallots (92.3%), cucumber (91.6%) and carrots (90.1%). Among male holders who grow shallots, cucumber, cabbage and carrots, more than 90.0 percent use pesticide and for females, more than 90.0 percent holders use pesticide to grow only cabbage.

The proportion of non-leafy vegetable holders who use irrigation is 31.4 percent. Among holders who cultivate shallots, 85.7 percent use irrigation followed by the holders who cultivate spring onions (74.5%) and carrots (71.1%). More males (35.6%) than females (21.9%) use irrigation in the cultivation of non-leafy vegetable crops. For the cultivation of four out of 13 non-leafy vegetable crops, shallots (86.4%), spring onion (73.4%) and carrots (72.5%), the proportion of males using irrigation is more than twice the average (35.6%). For the female holders, the use of

irrigation in the cultivation of seven out of 13 crops is more than twice the average (21.9%). Irrigation is hardly use in the cultivation of string bean (3.1% for males and 4.4% for females).

Relatively few holders (4.9%) use protective cover in the cultivation of non-leafy vegetable crops. Among holders who grow non-leafy vegetables, the proportions is as low as 0.9 percent for string beans and 10.9 percent for lettuce. The second highest in the use of protective cover, is among those cultivating Asian vegetables (10.0%). Among male holders cultivating Asian vegetables, lettuce and onions, about 11 percent use protective cover. For the females, it is only in the cultivation of string beans that more than 10 percent of holders use protective cover. (Table 8.37).

Table 8.37: Non-leafy vegetable holders 15 years or older by sex and type of vegetable, and by use of fertilizer, pesticide, irrigation and protective cover

Type of crop	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		Total
	Used	Did not use	Used	Did not use	Used	Did not use	Used	Did not use	
Total	111,090	79,344	157,911	32,523	59,833	130,601	9,335	181,099	190,434
Both Sexes	58.3	41.7	82.9	17.1	31.4	68.6	4.9	95.1	
Asian vegetables	70.0	30.0	70.0	30.0	35.0	65.0	10.0	90.0	20
Cabbage	85.1	14.9	92.7	7.3	56.8	43.2	7.5	92.5	7,336
Carrots	86.8	13.2	90.1	9.9	71.1	28.9	6.4	93.6	2,552
Garden eggs	65.9	34.1	86.4	13.6	33.5	66.5	6.9	93.1	28,214
Lettuce	67.4	32.6	77.0	23.0	63.2	36.8	10.9	89.1	734
String Beans	19.4	80.6	78.3	21.7	3.3	96.7	0.9	99.1	9,264
Okra	39.6	60.4	78.2	21.8	18.0	82.0	3.2	96.8	64,690
Pepper (Sweet)	65.1	34.9	85.2	14.8	37.9	62.1	7.2	92.8	9,971
Cucumber	74.3	25.7	91.6	8.4	56.0	44.0	5.0	95.0	1,378
Spring Onions	75.3	24.7	81.0	19.0	74.5	25.5	9.2	90.8	369
Tomato	70.8	29.2	85.7	14.3	36.9	63.1	4.9	95.1	56,947
Onions	89.3	10.7	78.8	21.2	67.9	32.1	9.7	90.3	8,545
Shallots	96.4	3.6	92.3	7.7	85.7	14.3	2.7	97.3	414
Total	85,426	46,512	114,133	17,805	47,033	84,905	6,951	124,987	131,938
Male	64.7	35.3	86.5	13.5	35.6	64.4	5.3	94.7	
Asian vegetables	72.2	27.8	72.2	27.8	38.9	61.1	11.1	88.9	18
Cabbage	85.4	14.6	92.9	7.1	57.4	42.6	7.3	92.7	6,689
Carrots	87.5	12.5	90.7	9.3	72.5	27.5	6.8	93.2	2,265
Garden eggs	71.2	28.8	89.7	10.3	35.8	64.2	7.3	92.7	20,196
Lettuce	69.5	30.5	78.8	21.2	65.6	34.4	11.6	88.4	604
String Beans	19.6	80.4	80.3	19.7	3.1	96.9	1.0	99.0	7,811
Okra	46.7	53.3	82.9	17.1	23.1	76.9	3.4	96.6	37,305
Pepper (Sweet)	70.1	29.9	87.7	12.3	42.2	57.8	7.7	92.3	6,962
Cucumber	74.5	25.5	92.1	7.9	56.9	43.1	5.4	94.6	1,175
Spring Onions	75.6	24.4	82.0	18.0	73.4	26.6	8.9	91.1	316
Tomato	75.9	24.1	88.6	11.4	39.1	60.9	5.0	95.0	41,591
Onions	90.9	9.1	82.1	17.9	69.5	30.5	10.7	89.3	6,646
Shallots	97.8	2.2	94.4	5.6	86.4	13.6	2.8	97.2	360
Total	25,664	32,832	43,778	14,718	12,800	45,696	2,384	56,112	58,496
Female	43.9	56.1	74.8	25.2	21.9	78.1	4.1	95.9	
Asian vegetables	50.0	50.0	50.0	50.0	0.0	100.0	0.0	100.0	2
Cabbage	82.1	17.9	90.9	9.1	51.5	48.5	8.7	91.3	647
Carrots	80.8	19.2	85.7	14.3	60.3	39.7	3.8	96.2	287
Garden eggs	52.5	47.5	78.3	21.7	27.7	72.3	6.2	93.8	8,018
Lettuce	57.7	42.3	68.5	31.5	52.3	47.7	7.7	92.3	130
String Beans	18.0	82.0	67.4	32.6	4.4	95.6	0.8	99.2	1,453
Okra	29.9	70.1	71.9	28.1	11.0	89.0	2.9	97.1	27,385
Pepper (Sweet)	53.7	46.3	79.4	20.6	27.8	72.2	6.0	94.0	3,009
Cucumber	73.4	26.6	88.7	11.3	50.2	49.8	3.0	97.0	203
Spring Onions	73.6	26.4	75.5	24.5	81.1	18.9	11.3	88.7	53
Tomato	56.9	43.1	78.1	21.9	30.8	69.2	4.5	95.5	15,356
Onions	84.0	16.0	67.4	32.6	62.2	37.8	6.1	93.9	1,899
Shallots	87.0	13.0	77.8	22.2	81.5	18.5	1.9	98.1	54

8.6.8 Industrial crops and use of selected inputs

The proportion of industrial crop holders who use fertilizer is 21.7 percent and for specific industrial crops, cotton (86.4%) is the highest, followed by tobacco (51.1%) in the usage of fertilizer. Among the male holders, cotton (86.5%) and jute (66.7%) are crops for which majority of holders use fertilizer. For the female holders, cotton (80.0%), seri-culture (75.0%) and tobacco (72.8%) are the crops for which fertilizer is mostly used.

Majority (64.0%) of industrial crop holders use pesticide with cotton (90.0%), seri-culture (85.7%), sisal (68.8%) and sugar cane (67.3%) being crops for which at least two-thirds of holders use pesticide. For male and female holders, cotton (90.6%), sweet berry (83.3%) and seri-culture (80.0%) are the crops for which more than two-thirds of holders use pesticides. In addition, more than two-thirds of female holders cultivating jute (66.7%), tobacco (73.8%), sugar cane (70.8%) and citronella (66.7%) use pesticides.

Only one in five industrial crop holders use irrigation. For four out of ten types of industrial crops, the use of irrigation is below the average (20.1%) and ranges from 0.0 in the cultivation of jute to 18.9 percent in the cultivation of tobacco. For males, irrigation is hardly used in the cultivation of jute, sisal and cotton (0.0% to 0.9%) and for females, no irrigation is used for citronella, cotton and jute.

The use of protective cover in the cultivation of industrial crops is not a common practice as it is used by only 3.2 percent of holders. The use of protective cover in the cultivation of five crops (citronella, cotton, jute, kanef and sugar cane) is less than the average (3.2%) and ranges from 0.0% for jute to 2.4 for sugar cane. For females, protective cover is not used at all in the cultivation of citrollena, cotton, jute and sunflower. For males, protective cover is not used for sweet berry and jute cultivation (Table 8.38).

8.6.9 Ornamental crops and use of selected inputs

About one-fifth (21.3%) of ornamental crop holders use fertilizer. The proportion of ornamental crop holders that use pesticide is 64.2 percent. Only 17 percent of holders of ornamental crops use irrigation. Protective cover is hardly use in the cultivation of ornamental crops.

Table 8.38: Industrial crop holders 15 years or older by sex and type of crop, and by use of fertilizer, pesticide, irrigation and protective cover

	Use of fertilizer		Use of pesticide		Use of irrigation		Use of protective cover		
	Did not		Did not		Did not		Did not		
Type of crop	Used	use	Used	use	Used	use	Used	use	Total
Total	2,268	8,170	6,680	3,758	2,099	8,339	334	10,104	10,438
Both Sexes	21.7	78.3	64.0	36.0	20.1	79.9	3.2	96.8	
Citronella	24.1	75.9	59.3	40.7	11.1	88.9	1.9	98.1	54
Cotton	86.4	13.6	90.7	9.3	0.9	99.1	1.0	99.0	1,456
Jute	37.5	62.5	37.5	62.5	0.0	100.0	0.0	100.0	8
Kenaf	10.0	90.0	14.0	86.0	52.7	47.3	1.4	98.6	961
Sisal	16.3	83.7	68.8	31.2	1.5	98.5	9.2	90.8	337
sweet berry	33.3	66.7	77.8	22.2	33.3	66.7	11.1	88.9	9
Sugar Cane	6.3	93.7	67.3	32.7	20.7	79.3	2.4	97.6	6,806
Tobacco	51.1	48.9	45.5	54.5	18.9	81.1	13.0	87.0	787
Sunflowers	16.7	83.3	16.7	83.3	50.0	50.0	16.7	83.3	6
Seri-culture	42.9	57.1	85.7	14.3	42.9	57.1	50.0	50.0	14
Ornamental crops*	21.3	78.7	64.2	35.8	17.0	83.0	6.0	94.0	
Total	2,029	6,301	5,384	2,946	1,618	6,712	239	8,091	8,330
Male	24.4	75.6	64.6	35.4	19.4	80.6	2.9	97.1	
Citronella	16.7	83.3	55.6	44.4	16.7	83.3	2.8	97.2	36
Cotton	86.5	13.5	90.6	9.4	0.9	99.1	1.0	99.0	1,431
Jute	66.7	33.3	66.7	33.3	0.0	100.0	0.0	100.0	3
Kenaf	9.9	90.1	13.8	86.2	57.9	42.1	0.6	99.4	636
Sisal	7.2	92.8	75.1	24.9	0.8	99.2	3.8	96.2	237
sweet berry	50.0	50.0	83.3	16.7	16.7	83.3	0.0	100.0	6
Sugar Cane	7.0	93.0	66.3	33.7	20.5	79.5	2.0	98.0	5,284
Tobacco	47.8	52.2	41.2	58.8	20.0	80.0	14.0	86.0	684
Sunflowers	33.3	66.7	33.3	66.7	33.3	66.7	33.3	66.7	3
Seri-culture	30.0	70.0	80.0	20.0	50.0	50.0	50.0	50.0	10
Ornamental crops*	20.6	79.4	68.2	31.8	17.1	82.9	7.0	93.0	
Total	239	1,869	1,296	812	481	1,627	95	2,013	2,108
Female	11.3	88.7	61.5	38.5	22.8	77.2	4.5	95.5	
Citronella	38.9	61.1	66.7	33.3	0.0	100.0	0.0	100.0	18
Cotton	80.0	20.0	92.0	8.0	0.0	100.0	0.0	100.0	25
Jute	20.0	80.0	20.0	80.0	0.0	100.0	0.0	100.0	5
Kenaf	10.2	89.8	14.5	85.5	42.5	57.5	2.8	97.2	325
Sisal	38.0	62.0	54.0	46.0	3.0	97.0	22.0	78.0	100
sweet berry	0.0	100.0	66.7	33.3	66.7	33.3	33.3	66.7	3
Sugar Cane	4.1	95.9	70.8	29.2	21.2	78.8	3.6	96.4	1,522
Tobacco	72.8	27.2	73.8	26.2	11.7	88.3	5.8	94.2	103
Sunflowers	0.0	100.0	0.0	100.0	66.7	33.3	0.0	100.0	3
Seri-culture	75.0	25.0	100.0	0.0	25.0	75.0	50.0	50.0	4
Ornamental crops*	23.4	76.6	53.2	46.8	16.8	83.2	3.0	97.0	

*Ornamental crop is not an industrial crop but included here for convenience and therefore not included in the industrial crop totals

8.7 Purpose for producing arable crops

Only about 7 percent of arable crop holders produce with the sole purpose of selling while 46.7 percent produce primarily for sale with minor consumption.

Conversely, about a quarter of arable crop holders produce for the sole purpose of consuming their own

There are two main purposes for cultivating arable crops; namely, for sale or for own consumption.

However, there are instances where arable crops are produced both for sales and for consumption. The GCA, therefore, considered four categories: own consumption only; own consumption with minor sales; sales only; and sales with minor consumption.

produce while 22.0 percent produce for own consumption with minor sales. The pattern is similar

for both males and females. For those who produce for sales with minor consumption and for own consumption with minor sales, the proportions are almost the same for males and females (Table 8.39).

In the case of those who produce for sales only, the proportion is slightly higher for males than for females by 1.1 percentage points and for own consumption only, the proportion is higher by 1.5 percentage points for females than males. For sales only and sales with minor consumption, the proportion is higher for the urban than for the rural areas. For own consumption only and for consumption with minor sales, the proportion is higher for the rural than in the urban areas. The urban-rural differential is more significant for own consumption with minor sales and for sales with minor consumption categories (by about 6 percentage points). For own consumption and sales only, the urban-rural differential is just about 1.5 percentage points. The pattern is similar for males and females though the magnitude of the differential is lower for females than for males (Table 8.39).

Herbs/spices, horticulture, non-leafy vegetables, industrial and ornamental crops are typically produced for sale only or sales with minor consumption and together constitute more than 70 percent of holders. For starchy staples, pulses/legumes and leafy vegetables, the proportion is almost equal for both consumption only and consumption with minor sales. The pattern holds true for urban-rural and for male-female holders.

Table 8.39: Arable crop holders* 15 years or older by sex and type of crop, and by purpose of production and type of locality

Sex/crop group	Own consumption only			Own consumption with minor sales			Sales only			Sales with minor consumption			Totals		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	178,816	767,722	946,538	129,036	725,190	854,226	64,170	203,305	267,475	397,812	1,410,727	1,808,539	769,834	3,106,944	3,876,778
Both Sexes	23.2	24.7	24.4	16.8	23.3	22.0	8.3	6.5	6.9	51.7	45.4	46.7			
Starchy staples	25.1	25.6	25.5	18.4	24.7	23.4	4.9	3.9	4.1	51.6	45.8	47	636,033	2,440,569	3,076,602
Pulses and legumes	18.3	30.2	28.8	13	22.9	21.7	21	10.8	12	47.7	36.1	37.5	56,486	404,195	460,681
Herbs/spices /condiments	10.2	6.4	7.1	8.1	12.3	11.5	28.3	25.2	25.8	53.4	56.1	55.6	23,380	95,177	118,557
Horticulture	6.7	3.1	3.9	2.6	3.3	3.1	35.9	37	36.8	54.8	56.6	56.2	3,189	11,284	14,473
Leafy vegetables	43.3	29	33.7	5.9	17.6	13.7	15.4	14.9	15.1	35.3	38.5	37.4	1,387	2,819	4,206
Non-leafy vegetables	10.8	9.3	9.7	5.1	11.8	10.1	26.7	21.2	22.6	57.4	57.8	57.7	47,420	143,014	190,434
Industrial crops	22.3	11.4	13.1	6.1	5.3	5.4	26.7	53.0	48.7	45.0	30.3	32.7	1939	9886	11,825
Total	120,067	560,973	681,040	89,538	538,447	627,985	49,174	155,206	204,380	283,847	1,039,857	1,323,704	542,626	2,294,483	2,837,109
Male	22.1	24.4	24	16.5	23.5	22.1	9.1	6.8	7.2	52.3	45.3	46.7			
Starchy staples	24	25.1	24.9	18.2	25.2	23.8	5.2	4	4.2	52.5	45.7	47	446,301	1,832,793	2,279,094
Pulses and legumes	18.2	30.3	28.8	13.4	22	20.9	22.7	11.6	13	45.7	36	37.2	41,169	290,002	331,171
Herbs/spices/condiments	9.5	5.9	6.6	6.9	8.1	7.8	31.2	29.4	29.8	52.3	56.6	55.7	14,201	56,465	70,666
Horticulture	5.7	2.7	3.4	2.2	3.1	2.9	37.2	37.2	37.2	54.9	57	56.5	2,723	9,676	12,399
Leafy vegetables	38	31.5	33.7	5.6	17.4	13.5	17.3	16	16.4	39.2	35.1	36.4	822	1,665	2,487
Non-leafy vegetables	9	7.9	8.2	4	8.1	7	29.1	24.4	25.7	57.9	59.6	59.2	35,931	96,007	131,938
Industrial crops	17.4	10.6	11.7	5.3	5.1	5.1	29.5	53.8	50.0	47.8	30.5	33.2	1479	7875	9,354
Total	58,773	206,769	265,542	39,510	186,802	226,312	14,964	48,018	62,982	113,974	370,859	484,833	227,221	812,448	1,039,669
Female	25.9	25.5	25.5	17.4	23	21.8	6.6	5.9	6.1	50.2	45.6	46.6			
Starchy staples	27.7	26.9	27.1	18.8	23.3	22.2	4.1	3.7	3.8	49.4	46.2	46.9	189,783	607,725	797,508
Pulses and legumes	18.3	29.9	28.6	12	25.2	23.6	16.3	8.5	9.4	53.3	36.4	38.4	15,310	114,200	129,510
Herbs/spices/ condiments	11.2	7.1	7.9	10	18.6	17	23.7	19	19.9	55.1	55.3	55.3	9,176	38,715	47,891
Horticulture	12.3	5	6.7	4.9	4.4	4.5	28.4	36	34.3	54.4	54.6	54.6	465	1,609	2,074
Leafy vegetables	51	25.3	33.7	6.4	17.8	14.1	12.8	13.5	13.3	29.8	43.3	38.9	563	1,156	1,719
Non-leafy vegetables	16.6	12.2	13.1	8.7	19.3	17.2	18.9	14.6	15.5	55.8	53.9	54.3	11,463	47,033	58,496
Industrial crops	38.2	14.5	18.9	8.9	6.0	6.6	17.6	50.0	44.0	35.4	29.5	30.6	461	2010	2,471

* A holder could cultivate more than one crop

8.8 Arable crop holders across ecological zones

Arable crops are mainly cultivated in the forest and northern savannah zones. About 45.0 percent of arable crop holders are in the forest zone followed by 39.1 percent in the northern savannah zone. Among holders, the males in the northern savannah zone have the highest proportion of arable crop holders (43.9%) while for the females, the highest proportion (55.3%) is in the forest zone (Table 8.40).

With respect to the specific crops cultivated, pulses/legumes are the lowest in the forest zone (6.2%) while horticulture is the lowest in the northern savannah zone (10.8%). The pattern is similar for males and females in both urban and rural areas.

The coastal savannah has the highest share in industrial crop and the second highest in horticultural crop cultivation. The transitional zone, and the coastal zones have the lowest share in the production of arable crops, however, the transitional zone, generally, has low share ranging from industrial (0.4%) to herbs/spices (12.0%). With the exception of starchy staples (8.0%) and pulses/legumes (8.0%), the transitional zone has the lowest share in the cultivation of all types of arable crops. This pattern holds true for urban and rural areas as well as for males and females with the exception of starchy staples where the share for coastal savannah is lower than that of the transitional zone (Table 8.40).

Table 8.40: Starchy staple holders 15 years or older by sex and type of crop, and by agro-ecological zone and type of locality

Type of crop	Coastal savannah			Forest			Transitional			Northern Savannah			Total ¹²		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	68,684	246,036	314,720	404,731	1,324,568	1,729,299	100,620	214,466	315,086	195,544	1,322,129	1,517,673	769,579	3,107,199	3,876,778
Both Sexes	8.9	7.9	8.1	52.6	42.6	44.6	13.1	6.9	8.1	25.4	42.6	39.1			
Starchy staples	7.7	7.3	7.4	57.0	48.6	50.3	12.2	6.9	8.0	23.1	37.2	34.3	635,734	2,440,868	3,076,602
Pulses and legumes	3.3	2.1	2.2	10.2	5.6	6.2	18.2	6.6	8.0	68.4	85.7	83.6	56,728	403,953	460,681
Herbs, spices & condiments	18.9	23.6	22.7	45.1	41.6	42.3	19.7	10.0	12.0	16.2	24.7	23.0	23,393	95,164	118,557
Horticulture	33.3	40.2	38.7	42.3	43.4	43.1	16.4	4.9	7.3	8.0	11.6	10.8	3,082	11,391	14,473
Leafy vegetables	39.5	18.0	25.3	34.6	30.9	32.1	2.6	1.2	1.6	23.3	49.9	40.9	1,429	2,777	4,206
Non-leafy vegetables	24.6	19.1	20.5	48.9	48.2	48.4	15.3	5.8	8.1	11.2	26.9	23.0	47,263	143,171	190,434
Industrial crops	27.5	38.9	37.0	52.8	23.5	28.3	3.8	1.3	1.7	15.9	36.3	32.9	1,950	9,875	11,825
Total	48,557	153,389	201,946	254,819	899,699	1,154,518	70,522	164,959	235,481	169,015	1,076,149	1,245,164	542,913	2,294,196	2,837,109
Male	8.9	6.7	7.1	46.9	39.2	40.7	13.0	7.2	8.3	31.1	46.9	43.9			
Starchy staples	7.6	6.0	6.3	50.5	43.8	45.1	12.3	7.3	8.3	29.5	42.9	40.3	446,517	1,832,577	2,279,094
Pulses and legumes	2.9	1.5	1.7	6.6	4.6	4.9	16.2	6.5	7.7	74.3	87.3	85.7	41,415	289,756	331,171
Herbs, spices & condiments	20.4	24.9	24.0	48.0	47.7	47.7	17.2	10.2	11.6	14.5	17.3	16.7	14,205	56,461	70,666
Horticulture	32.1	39.4	37.9	40.8	42.6	42.3	17.7	5.0	7.7	9.3	12.9	12.1	2,626	9,773	12,399
Leafy vegetables	41.6	17.2	25.6	33.8	27.6	29.7	2.8	1.1	1.7	21.8	54.1	43.0	855	1,632	2,487
Non-leafy vegetables	25.0	18.8	20.5	48.8	52.8	51.7	15.9	6.5	9.1	10.3	21.9	18.8	35,814	96,124	131,938
Industrial crops	28.0	35.2	34.0	54.8	23.9	28.8	4.3	1.2	1.7	12.9	39.7	35.5	1,481	7,873	9,354
Total	20,127	92,647	112,774	149,912	424,869	574,781	30,098	49,507	79,605	26,529	245,980	272,509	226,666	813,003	1,039,669
Female	8.9	11.4	10.8	66.1	52.3	55.3	13.3	6.1	7.7	11.7	30.3	26.2			
Starchy staples	7.8	11.3	10.5	72.3	62.9	65.2	12.0	5.9	7.4	7.9	19.8	17.0	189,217	608,291	797,508
Pulses and legumes	4.3	3.4	3.5	19.7	8.2	9.5	23.5	6.7	8.7	52.5	81.7	78.2	15,313	114,197	129,510
Herbs, spices & condiments	16.6	21.8	20.8	40.7	32.8	34.3	23.7	9.9	12.5	18.9	35.6	32.4	9,188	38,703	47,891
Horticulture	39.7	44.7	43.6	51.1	47.6	48.4	8.6	4.0	5.0	0.7	3.7	3.0	456	1,618	2,074
Leafy vegetables	36.4	19.2	25.0	35.7	35.6	35.7	2.3	1.2	1.6	25.6	43.9	37.8	574	1,145	1,719
Non-leafy vegetables	23.5	19.7	20.5	49.3	39.0	41.0	13.3	4.3	6.1	13.9	37.0	32.5	11,449	47,047	58,496
Industrial crops	26.0	53.6	48.4	46.3	22.0	26.6	2.3	1.4	1.6	25.4	22.9	23.4	469	2,002	2,471

¹² Refer to Table 8.2 for the percent distribution

8.9 Production of arable crops

Starchy staples are the main crops produced (27,404,827.0 mts) by arable crop holders, constituting 94.4 percent. Pulses/legumes (673,875.3 mts) and non-leafy vegetables (320,492.6 mts), constituting 2.3 percent and 1.1 percent respectively, were the other major crop types produced by farmers (Table 8.41).

About half (49.9%) of the total production of arable crops is on a small-scale level while medium and large-scale production each forms about a quarter of the total production. Majority of the production of all arable crops except starchy staples and horticultural crops is on a small-scale. For horticultural crops, the majority of the quantity produced is on a large-scale while medium-scale production forms a third or less of the quantity produced.

Small and large-scale production conform to the general pattern, except for starchy staples for which small-scale forms the majority (50.4%) in the rural areas. Medium-scale production in the rural areas is less than a third for all types of arable crops.

For urban areas, small-scale production forms the majority of three out of eight types of arable crops, namely, leafy vegetables, herbs/spices, and non-leafy vegetables. Medium-scale production forms two of the remaining crops namely; horticultural (56.0%) and industrial crops (59.1%). Further, in rural areas, all types of arable crops, except horticultural crops form the majority for small-scale production, see Table 8.41.

The distribution of the quantity sold across the scale of production is similar to the distribution of the quantity produced (Figure 8.4). There is little variation in the proportion of sales to production between urban and rural areas with the exception of herbs/spices where the proportion of production sold in urban areas is 12 percentage points higher than in rural areas. A similar variation is observed for the production and sales of horticultural crops with 9.5 percentage points difference. (Figure 8.5)

Figure 8.5. Proportion of quantity sold to quantity produced of types of arable crop by type of locality (percent)

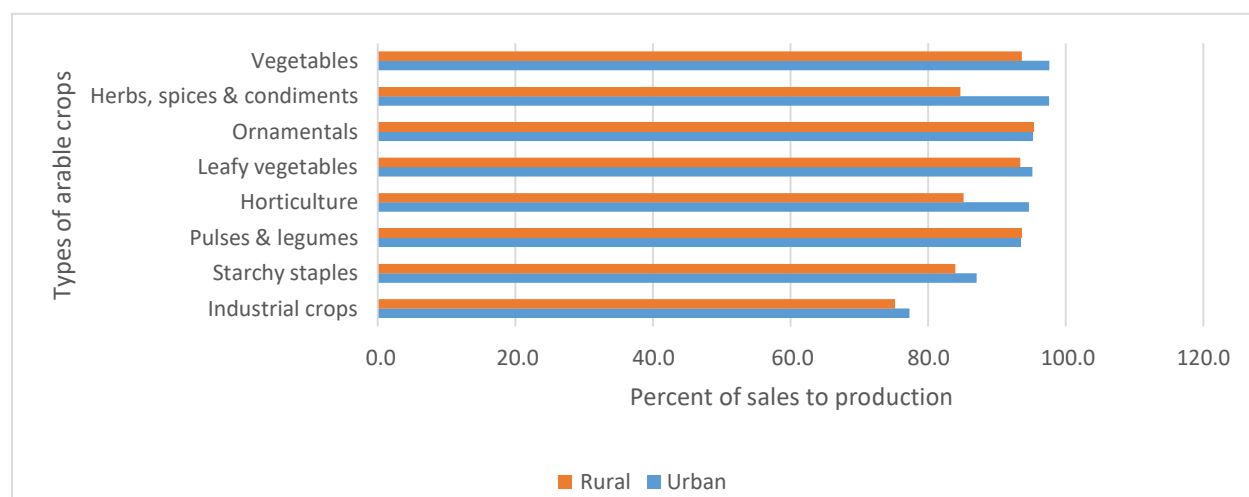


Table 8.41: Quantity of arable crops (mts) by type of locality and type of crop, and by quantity produced, quantity sold, cost of production and scale of production

Types of arable crops	Production (mts)			Quantity (mts)	Sales (mts)			Number (mts)	Cost of production ('000 GHC)			N(GHC)
	Small	Medium	Large		Small	Medium	Large		Small	Medium	Large	
Total	14,462,308	7,029,158	7,527,896	29,019,363	10,787,768	5,617,192	5,789,581	22,194,541	968,426	535,556	419,393	1,923,375
All crops	49.9	24.2	25.9		48.6	25.3	26.1		50.4	27.8	21.8	
Starchy staples	49.5	24.2	26.3	27,404,827	48.1	25.4	26.5	20,725,303	47.1	28.8	24.1	1,502,618
Pulses and legumes	61.0	21.1	17.9	673,875	60.6	20.7	18.7	591,482	57.0	27.3	15.7	187,814
Herbs, spices	66.6	26.5	6.9	175,210	65.8	27.2	7.0	164,295	68.9	21.2	9.9	67,545
Horticulture	14.4	33.8	51.8	227,210	13.5	31.5	55.0	212,753	47.0	30.9	22.1	23,381
Leafy vegetables	88.1	8.0	3.9	1,980	88.6	7.8	3.6	1,908	74.2	10.0	15.8	1,322
Non-leafy vegetables	64.0	23.2	12.8	389,993	64.0	23.1	12.9	371,665	67.0	21.7	11.3	132,437
Industrial crops	63.5	30.6	5.9	146,268	59.8	33.7	6.5	127,135	68.6	18.3	13.1	8,257
Total	2,776,809	1,511,596	1,777,952	6,066,356	2,281,228	1,234,991	1,251,285	4,767,505	217,212	130,421	110,184	457,818
Urban	45.8	24.9	29.3		47.9	25.9	26.2		47.4	28.5	24.1	
Starchy staples	45.6	24.7	29.7	5,615,219	47.8	25.8	26.4	4,339,862	44.4	29.2	26.4	353,817
Pulses / legumes	48.4	15.7	35.9	185,580	48.1	15.0	36.9	175,624	44.2	31.4	24.4	31,428
Herbs, spice	64.5	26.7	8.8	35,965	63.9	27.2	8.9	34,220	66.0	23.0	11.0	15,988
Horticulture	10.6	56.0	33.4	63,333	9.1	55.6	35.3	59,195	35.8	34.9	29.3	6,035
Leafy vegetables	93.9	3.2	2.9	1,353	94.1	3.2	2.7	1,321	68.9	11.9	19.2	644
Non-leafy vegetables	62.7	25.6	11.7	135,122	63.2	25.2	11.6	128,734	66.0	23.2	10.8	48,755
Industrial crops	42.7	52.3	5.0	29,785	41.8	53.2	5.1	28,549	57.7	14.9	27.4	1,149
Total	11,685,500	5,517,562	5,749,945	22,953,007	8,506,540	4,382,200	4,538,296	17,427,037	751,214	405,135	309,208	1,465,557
Rural	50.9	24.0	25.1		48.8	25.1	26.0		51.3	27.6	21.1	
Starchy staples	50.4	24.1	25.5	21,789,608	48.2	25.2	26.5	16,385,442	47.9	28.7	23.4	1,148,800
Pulses and legumes	65.7	23.2	11.1	488,295	65.9	23.1	11.0	415,858	59.6	26.5	13.9	156,386
Herbs, spices	67.0	26.5	6.5	139,245	66.3	27.2	6.5	130,076	69.8	20.7	9.5	51,557
Horticulture	15.9	25.2	58.9	163,877	15.2	22.2	62.6	153,557	50.9	29.5	19.6	17,346
Leafy vegetables	75.8	18.2	6.0	627	76.5	18.1	5.4	587	79.2	8.1	12.7	678
Non-leafy vegetables	64.6	22.0	13.4	254,870	64.3	22.1	13.6	242,931	67.5	20.9	11.6	83,681
Industrial crops	68.8	25.1	6.2	116,483	65.1	28.0	6.9	98,586	70.3	18.8	10.8	7,109

Small-scale= Small-scale farmers (farmed less than or equal to 2 acres)

Medium-scale= Medium-scale farmers (farmed more than 2 but less than or equal to 5 acres)

Large-scale =Large-scale farmers (farmed more than 5 acres)

CHAPTER NINE

TREE CROPS

9.1 Introduction

This chapter presents the results on perennial crops, such as fruit trees, cocoa and nuts grown mainly for economic benefits. The chapter discusses the characteristics of holders, type of cropping system practiced, size of parcels, quantity produced and sold, production in ecological zones and use of fertilizer, pesticide and irrigation in the production of tree crops.

9.2 Socio-demographic characteristics of tree crop holders

9.2.1 Age and sex of tree crop holders

The participation of young holders aged less than 35 years is minimal. More than eight in ten (84.1%) of all tree crop holders are 36 years or older for each type of tree crop and for males and females except for holders of shea nut where the proportions are less than 80 percent for both males and females.

Tree crop holders in the age group of 36-59 years range from 55.1 percent among those growing cola to 64.0 percent among those growing rubber. Holders who are 60 years or older vary from 18.8 percent among those cultivating shea nuts to 35.0 percent among those cultivating cola for all tree crop types. A similar pattern is observed for males and females for all tree crop types. The proportion of holders in the age group 36-59 years is higher for males than females, except for holders growing pawpaw. For holders who are 60 years or older, the proportion is higher for females than males, except for holders who grow shea nuts (Table 9.1).

Table 9.1: Tree crop holders 15 years or older by sex and age, and by type of crop

Age group	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber	Total
Both Sexes	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322	765,885
15-19	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.0	0.1
20-24	0.8	1.1	1.0	1.0	0.8	0.7	0.7	0.5	0.7	0.5	0.0	1.1	1.4	0.8	0.9
25-29	4.5	4.1	4.6	4.2	3.0	2.7	2.2	1.9	3.5	2.3	2.9	4.6	5.4	3.4	4.0
30-35	9.8	10.5	12.7	11.4	8.6	7.4	7.0	6.5	9.2	7.9	10.9	12.6	16.8	10.6	11.0
36-59	58.9	57.2	58.4	60.7	57.6	58.9	55.1	57.5	57.9	62.6	60.4	62.3	57.3	64.0	60.5
60+	26.0	27.0	23.3	22.7	29.9	30.4	35.0	33.5	28.7	26.6	25.8	19.3	18.8	21.2	23.6
Male	2,391	6,606	64,770	463,662	8,633	1,012	778	13,649	4,674	69,072	196	1,549	293	3,769	571,741
15-19	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.0	0.1
20-24	0.9	1.2	1.1	1.1	0.8	0.7	0.8	0.5	0.7	0.5	0.0	1.2	1.4	0.9	1.0
25-29	5.1	4.7	5.0	4.8	3.4	3.0	2.8	2.2	3.6	2.6	3.1	5.0	4.4	3.6	4.5
30-35	10.4	11.7	13.5	12.5	9.2	7.8	8.2	6.8	9.5	8.5	11.2	13.6	14.7	11.1	11.9
36-59	58.9	57.8	59.6	61.3	58.5	59.1	56.2	58.0	58.9	63.3	61.2	62.2	58.0	64.2	61.2
60+	24.7	24.6	20.8	20.3	28.0	29.4	32.0	32.4	27.3	25.1	24.5	17.9	21.2	20.2	21.4
Female	620	2,125	25,175	156,204	1,731	209	255	3,463	812	17,393	79	318	75	553	194,145
15-19	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-24	0.6	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.6	0.3	0.0	0.9	1.3	0.2	0.6
25-29	2.3	2.4	3.7	2.6	1.3	1.4	0.4	1.1	3.1	1.4	2.5	2.5	9.3	2.2	2.6
30-35	7.4	6.8	10.5	8.2	5.5	5.3	3.1	5.3	7.4	5.6	10.1	8.2	25.3	6.5	8.2
36-59	58.5	55.3	55.3	58.7	52.9	57.9	51.8	55.3	52.1	60.0	58.2	62.6	54.7	63.1	58.2
60+	31.1	34.6	29.8	29.8	39.6	34.9	44.3	38.0	36.8	32.7	29.1	25.8	9.3	28.0	30.3

9.2.2 *Youth Holders*

The youth population engaged in tree crop constitute about 15 percent of all tree crop holders with the proportion of youth among shea nut holders (23.9%) being the highest while their counterparts in citrus (9.0%) is the least. Most of the tree crop youth holders are in the 25-35 years age group for all types of tree crops. Majority of youth holders (15-35 years) in the cultivation of tree crop are males. At least three quarters of the tree crop youth holders are males with higher proportions of about 90 percent among those cultivating rubber, cola, and coconut. (Table 9.2).

Table 9.2: Tree crop holders 15-35 years (youth) by sex and age, and by type of crop

Age group	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber
All Tree crop holders	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322
Both Sexes	455	1,381	16,480	103,074	1,294	131	102	1,544	736	9,297	38	344	88	640
15-19	1	9	85	422	7	0	0	11	2	23	0	1	1	0
20-24	25	94	861	5,978	81	8	7	82	37	418	0	21	5	36
25-29	135	362	4,145	26,102	316	33	23	333	191	2,026	8	86	20	148
30-35	294	916	11,389	70,572	890	90	72	1,118	506	6,830	30	236	62	456
Youth														
15-24	26	103	946	6,400	88	8	7	93	39	441	0	22	6	36
15-35	455	1,381	16,480	103,074	1,294	131	102	1,544	736	9,297	38	344	88	640
Male	391	1,166	12,715	85,097	1,164	116	92	1,313	646	8,033	28	307	61	591
15-19	1	8	65	343	6	0	0	11	2	19	0	1	1	0
20-24	21	76	681	4,941	70	7	6	72	32	368	0	18	4	35
25-29	121	311	3,221	22,066	294	30	22	296	166	1,783	6	78	13	136
30-35	248	771	8,748	57,747	794	79	64	934	446	5,863	22	210	43	420
Youth														
15-24	22	84	746	5,284	76	7	6	83	34	387	0	19	5	35
15-35	391	1,166	12,715	85,097	1,164	116	92	1,313	646	8,033	28	307	61	591
Female	64	215	3,765	17,977	130	15	10	231	90	1,264	10	37	27	49
15-19	0	1	20	79	1	0	0	0	0	4	0	0	0	0
20-24	4	18	180	1,037	11	1	1	10	5	50	0	3	1	1
25-29	14	51	924	4,036	22	3	1	37	25	243	2	8	7	12
30-35	46	145	2,641	12,825	96	11	8	184	60	967	8	26	19	36
Youth														
15-24	4	19	200	1,116	12	1	1	10	5	54	0	3	1	1
15-35	64	215	3,765	17,977	130	15	10	231	90	1,264	10	37	27	49
Percent of population														
15-24	0.9	1.2	1.1	1.0	0.8	0.7	0.7	0.5	0.7	0.5	0.0	1.2	1.6	0.8
15-35	15.1	15.8	18.3	16.6	12.5	10.7	9.9	9.0	13.4	10.8	13.8	18.4	23.9	14.8
Sex composition														
Youth 15-24	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0
Male	84.6	81.6	78.9	82.6	86.4	87.5	85.7	89.2	87.2	87.8	0.0	86.4	83.3	97.2
Female	15.4	18.4	21.1	17.4	13.6	12.5	14.3	10.8	12.8	12.2	0.0	13.6	16.7	2.8
Youth 15-35	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male	85.9	84.4	77.2	82.6	90.0	88.5	90.2	85.0	87.8	86.4	73.7	89.2	69.3	92.3
Female	14.1	15.6	22.8	17.4	10.0	11.5	9.8	15.0	12.2	13.6	26.3	10.8	30.7	7.7

9.2.3 Educational attainment and literacy status of Tree crop holders

More than 50% of tree crop holders have attained basic level of education except for holders who cultivate cashew (46.6%), mango (42.5%) and shea nut (25.8%). For holders who cultivate shea nut, the majority have never attended school, whereas for cashew and mango producers, the proportions who have never attended school are about one-third and one-quarter respectively.

On average, about 7 percent of tree crop holders have attained tertiary education with a relatively higher proportion among holders cultivating mango (15.3%), guava (13.8%), pawpaw (10.6%) and rubber (9.7%). The proportions of holders who have attained basic education is higher for males than for females for all types of tree crops, except for holders who cultivate guava. A similar pattern of difference in educational attainment for males and females is observed for holders who have attained secondary or vocational education (Table 9.3).

**Table 9.3: Tree crop holders 15 years or older by sex and educational attainment,
and by type of crop**

Educational attainment/Sex of holder	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber
All														
Total	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322
Never attended	23.0	19.3	37.2	26.6	22.1	16.4	20.0	21.2	26.4	19.8	17.1	16.1	62.2	15.5
Basic education	58.5	65.4	46.6	61.7	58.1	69.9	68.3	61.4	42.5	66.5	54.2	58.1	25.8	59.5
Secondary/vocational	11.8	10.1	10.2	8.1	11.4	8.9	7.7	9.1	14.1	8.6	13.8	13.9	5.4	14.0
Post-secondary diploma	1.0	1.0	0.6	0.6	1.0	0.8	0.7	1.2	1.8	0.8	1.1	1.3	1.4	1.3
Tertiary	5.7	4.2	5.3	3.1	7.4	4.0	3.2	7.2	15.3	4.3	13.8	10.6	5.2	9.7
Male														
Total	2,391	6,606	64,770	463,662	8,633	1,012	778	13,649	4,674	69,072	196	1,549	293	3,769
Never attended	20.0	14.8	31.9	21.0	17.8	13.9	14.7	16.1	25.2	15.3	15.8	14.0	58.7	12.4
Basic education	59.4	67.2	48.4	64.9	60.5	70.8	71.3	63.9	41.9	68.9	53.1	58.4	26.6	60.5
Secondary/vocational	13.2	12.1	12.2	9.6	12.5	9.7	9.3	10.2	14.8	9.8	12.8	15.1	6.8	15.3
Post-secondary diploma	1.0	1.1	0.8	0.7	1.1	0.9	0.9	1.4	1.9	0.9	1.5	1.3	1.7	1.4
Tertiary	6.4	4.9	6.7	3.9	8.1	4.7	3.9	8.5	16.2	5.0	16.8	11.2	6.1	10.4
Female														
Total	620	2,125	25,175	156,204	1,731	209	255	3,463	812	17,393	79	318	75	553
Never attended	34.5	33.1	50.8	43.2	43.6	28.2	36.5	41.3	33.4	37.9	20.3	26.4	76.0	36.7
Basic education	55.0	60.1	42.0	52.2	46.0	65.6	59.2	51.3	46.1	57.1	57.0	56.9	22.7	52.4
Secondary /vocational	6.3	4.0	5.0	3.4	6.2	5.3	3.1	4.7	9.5	3.5	16.5	8.2	0.0	5.2
Post-secondary diploma	1.0	0.7	0.3	0.2	0.6	0.5	0.0	0.5	1.2	0.3	0.0	1.3	0.0	0.7
Tertiary	3.2	2.0	1.9	0.9	3.6	0.5	1.2	2.2	9.9	1.2	6.3	7.2	1.3	4.9

Literacy status of tree crop holders

Generally, majority (more than half) of tree crop holders are literate in at least one language for all types of tree crops with the proportions much higher (more than two-thirds) among holders who cultivate guava (79.6%), pawpaw (76.5%), rubber (75.6%), coffee (73.9%), mango (72.9%), citrus (71.2%), cola (70.8%), coconut (70.3%), oil palm (69.5%) and banana (69.2%), except for shea nut where majority are not literate (54.1%). Literacy in English with a Ghanaian language constitute the highest proportion of at least 40.0 percent, except for holders engaged in cashew (31.3%), cocoa (35.2%) and coffee (39.9%).

More males than females are literate in at least one language with higher proportions of female holders cultivating shea nut (76.0%), cashew (62.2%), cocoa (54.6%), coconut (51.8%) and avocado (51.6%) not literate. Similarly, a higher proportion of males than females are literate in the English with a Ghanaian language and English only literacy domains for all types of tree crops, except for shea nut where a higher proportion of females than males are literate in English only. For all types of tree crops more females than males are literate in a Ghanaian language only (Table 9.4).

Table 9.4: Tree crop holders 15 years or older by sex, literacy status and language, and by type of crop

Literacy and sex	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber
Both Sexes														
Total	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322
None (not literate)	36.7	30.8	46.5	37.1	29.7	26.1	29.2	28.8	27.1	30.5	20.4	23.5	54.1	24.4
Literate	63.3	69.2	53.5	62.9	70.3	73.9	70.8	71.2	72.9	69.5	79.6	76.5	45.9	75.6
Literate	1,905	6,042	48,162	389,802	7,283	902	731	12,185	3,997	60,097	219	1,428	169	3,268
English only	10.1	8.0	6.7	7.4	10.4	3.2	4.2	7.5	10.7	7.9	9.5	11.7	6.0	15.8
Ghanaian language only	12.4	19.1	13.3	19.2	13.9	28.4	26.0	16.6	9.6	19.2	16.4	16.1	19.8	9.7
English and Ghanaian	40.0	41.4	31.3	35.2	44.9	39.9	40.1	46.3	48.6	41.5	51.2	47.4	18.5	49.5
English and French	0.2	0.1	0.1	0.1	0.1	0.5	0.0	0.1	0.1	0.1	0.0	0.2	0.0	0.0
English, French and Ghanaian language	0.2	0.2	0.1	0.1	0.4	0.8	0.0	0.2	0.4	0.1	0.7	0.4	0.5	0.3
Other languages	0.4	0.4	2.0	0.9	0.6	1.1	0.5	0.5	3.5	0.7	1.8	0.7	1.1	0.3
Male														
Total	2,391	6,606	64,770	463,662	8,633	1,012	778	13,649	4,674	69,072	196	1,549	293	3,769
None (not literate)	32.9	26.1	40.4	31.2	25.3	22.7	25.1	23.6	25.4	25.6	18.9	20.9	48.5	20.3
Literate	67.1	73.9	59.6	68.8	74.7	77.3	74.9	76.4	74.6	74.4	81.1	79.1	51.5	79.7
Literate	1,605	4,885	38,634	318,925	6,448	782	583	10,425	3,489	51,391	159	1,226	151	3,005
English only	11.1	9.3	7.9	8.6	11.4	3.5	4.1	8.5	11.3	8.9	9.7	12.8	5.8	17.0
Ghanaian language only	11.3	17.2	13.1	18.3	13.1	26.7	24.7	15.4	8.9	18.1	13.3	14.7	21.5	9.1
English and Ghanaian	43.8	46.7	36.7	40.8	49.0	44.3	45.6	51.6	50.6	46.5	56.6	50.5	22.2	53.0
English and French	0.2	0.2	0.1	0.1	0.1	0.6	0.0	0.1	0.1	0.1	0.0	0.3	0.0	0.0
English, French and Ghanaian language	0.3	0.2	0.1	0.1	0.5	1.0	0.0	0.2	0.4	0.1	0.5	0.4	0.7	0.3
Other languages	0.4	0.4	1.8	0.9	0.7	1.3	0.5	0.5	3.4	0.7	1.0	0.5	1.4	0.3
Female														
Total	620	2,125	25,175	156,204	1,731	209	255	3,463	812	17,393	79	318	75	553
None (not literate)	51.6	45.6	62.2	54.6	51.8	42.6	42	49.2	37.4	49.9	24.1	36.5	76	52.4
Literate	48.4	54.4	37.8	45.4	48.2	57.4	58	50.8	62.6	50.1	75.9	63.5	24	47.6
Literate	300	1,157	9,528	70,877	835	120	148	1,760	508	8,706	60	202	18	263
English only	6.1	4.0	3.8	3.9	5.5	1.9	4.3	3.8	7.5	4.1	8.9	6.3	6.7	7.6
Ghanaian language only	16.8	24.8	14.1	22.0	17.4	36.8	30.2	21.1	13.4	23.6	24.1	23.3	13.3	14.1
English and Ghanaian	25.3	25.0	17.3	18.6	24.6	18.2	23.1	25.5	37.4	21.6	38.0	31.8	4.0	25.5
English and French	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2
English, French and Ghanaian language	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	1.3	0.3	0.0	0.0
Other languages	<u>0.2</u>	<u>0.6</u>	<u>2.5</u>	<u>0.9</u>	<u>0.5</u>	<u>0.5</u>	<u>0.4</u>	<u>0.4</u>	<u>4.2</u>	<u>0.7</u>	<u>3.8</u>	<u>1.9</u>	<u>0.0</u>	<u>0.2</u>

9.2.4 Nationality of holders

Almost all holders (99.7%) cultivating tree crops are Ghanaians. The proportion of non-Ghanaians is higher than the average (0.3) for holders cultivating coffee (1.3%), cola (0.4%) and Guava (0.4%).

The proportion of Togolese holders cultivating tree crops are the highest among the non-Ghanaians for each type of tree crop. Most of the non-Ghanaians grow cocoa (1,097 out of 1501), see Table 9.5.

Table 9.5: Tree crop holders 15 years or older by nationality, and by type of crop

<u>Nationality</u>	<u>Avocado</u>	<u>Banana</u>	<u>Cashew</u>	<u>Cocoa</u>	<u>Coconut</u>	<u>Coffee</u>	<u>Cola</u>	<u>Citrus</u>	<u>Mango</u>	<u>Oil- palm</u>	<u>Guava</u>	<u>Pawpaw</u>	<u>Shea nut</u>	<u>Rubber</u>
Both Sexes														
Total	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322
Ghanaian	99.7	99.7	99.9	99.8	99.8	98.7	99.6	99.9	99.9	99.8	99.6	99.6	100.0	99.9
Non-Ghanaian	0.3	0.3	0.1	0.2	0.2	1.3	0.4	0.1	0.1	0.2	0.4	0.4	0.0	0.1
Non-Ghanaian	10	23	131	1,097	19	16	4	25	8	156	1	7	0	4
<i>Burkina Faso</i>	0.0	8.7	32.1	19.0	10.5	6.3	0.0	16.0	25.0	5.8	0.0	0.0	0.0	0.0
<i>Cote d'Ivoire</i>	20.0	4.3	38.2	13.3	42.1	0.0	0.0	12.0	0.0	5.8	0.0	0.0	0.0	0.0
<i>Nigeria</i>	10.0	17.4	3.1	3.1	5.3	0.0	0.0	8.0	25.0	3.2	0.0	42.9	0.0	0.0
<i>Togo</i>	30.0	60.9	7.6	45.1	5.3	87.5	50.0	20.0	12.5	66.0	100.0	57.1	0.0	50.0
<i>Other African</i>	30.0	8.7	19.1	19.5	31.6	6.3	50.0	36.0	25.0	19.2	0.0	0.0	0.0	50.0
<i>Non -Africans</i>	<u>10.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>5.3</u>	<u>0.0</u>	<u>0.0</u>	<u>8.0</u>	<u>12.5</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>

9.2.5 Disability status of holders

Generally, more than one percent of tree crop holders have some form of disability and the proportions are higher among holders who cultivate oil-palm (1.6%), citrus (1.6%), guava (1.5%), avocado (1.5%) and banana (1.5%). A similar pattern is observed for males and females with the proportions of female holders who have some form of disability, higher than males for all types of tree crops (Table 9.6).

Table 9.6: Tree crop holders 15 years or older by sex and disability status, and by type of crop

Disability status	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber
Both sexes														
Total	3,011	8,731	89,945	619,866	10,364	1,221	1,033	17,112	5,486	86,465	275	1,867	368	4,322
Without Disability	98.5	98.5	99.2	98.8	98.7	98.9	98.6	98.4	98.7	98.4	98.5	99.0	99.2	99.0
With Disability	1.5	1.5	0.8	1.2	1.3	1.1	1.4	1.6	1.3	1.6	1.5	1.0	0.8	1.0
Male														
Total	2,391	6,606	64,770	463,662	8,633	1,012	778	13,649	4,674	69,072	196	1,549	293	3,769
Without Disability	98.6	98.6	99.2	98.9	98.8	99.0	99.1	98.3	98.8	98.4	98.5	99.2	99.7	99.1
With Disability	1.4	1.4	0.8	1.1	1.2	1.0	0.9	1.7	1.2	1.6	1.5	0.8	0.3	0.9
Female														
Total	620	2,125	25,175	156,204	1,731	209	255	3,463	812	17,393	79	318	75	553
Without Disability	97.9	98.2	99.0	98.5	98.4	98.6	97.3	98.5	97.9	98.2	98.7	98.4	97.3	98.2
With Disability	2.1	1.8	1.0	1.5	1.6	1.4	2.7	1.5	2.1	1.8	1.3	1.6	2.7	1.8

Types of disability of tree crop holders

The total responses for holders with some form of disability engaged in cocoa constitute 69.8 percent and distantly followed by oil-palm (16.6%). The common form of disability of tree crop holders is physical disability and this is followed by challenges with sight except for holders cultivating coffee, cola, guava and shea nut. Generally, higher proportion of female than male tree crop holders are physically challenged with the exception of holders engaged in avocado and guava where proportion of male holders who are physically challenged, are higher than females (Table 9.7).

Table 9.7: Tree crop holders 15 years or older by sex and type of disability, and by type of crop

Type of disability	Avocado	Banana	Cashew	Cocoa	Coconut	Coffee	Cola	Citrus	Mango	Oil-palm	Guava	Pawpaw	Shea nut	Rubber
Both sexes														
Total responses* **	65	186	962	10583	161	17	17	476	87	2515	4	25	3	52
Sight	26.2	27.4	25.5	29.1	34.8	47.1	52.9	28.2	29.9	29.1	50.0	28.0	100.0	32.7
Hearing	15.4	14.5	14.1	15.3	11.2	11.8	11.8	15.5	12.6	17.6	0.0	16.0	0.0	13.5
Speech	10.8	15.1	10.7	12.8	6.8	5.9	5.9	15.8	8.0	16.1	0.0	12.0	0.0	9.6
Physical	47.7	43.0	49.7	42.7	47.2	35.3	29.4	40.5	49.4	37.2	50.0	44.0	0.0	44.2
Male														
Total responses	48	92	487	4,934	103	10	7	228	57	1,081	3	13	1	35
Sight	25.0	28.0	26.5	29.3	33.8	50.0	50.0	28.1	30.3	28.9	66.7	21.1	100.0	28.6
Hearing	12.5	12.1	13.6	15.6	12.3	14.3	20.0	15.7	13.6	17.9	0.0	21.1	0.0	14.3
Speech	8.3	15.9	11.6	13.7	8.5	7.1	10.0	16.0	7.6	16.5	0.0	15.8	0.0	11.9
Physical	54.2	43.9	48.3	41.4	45.4	28.6	20.0	40.2	48.5	36.7	33.3	42.1	0.0	45.2
Female														
Total responses	17	38	261	2,383	28	3	7	53	17	317	1	5	2	10
Sight	29.4	25.9	23.6	28.7	38.7	33.3	57.1	28.4	28.6	30.0	0.0	50.0	100.0	50.0
Hearing	23.5	20.4	15.1	14.8	6.5	0.0	0.0	14.8	9.5	16.5	0.0	0.0	0.0	10.0
Speech	17.6	13.0	9.1	10.8	0.0	0.0	0.0	14.8	9.5	14.6	0.0	0.0	0.0	0.0
Physical	29.4	40.7	52.3	45.7	54.8	66.7	42.9	42.0	52.4	38.9	100.0	50.0	0.0	40.0

*A person could have more than one form of disability.

** The summation of responses for tree crop holders with some form of disability is 15,153

9.3 Tree crop holders and type of cropping

About three-quarters (74.7%) of tree crop holders are males. On the average, the proportion of female holders cultivating tree crops is just about a quarter (25.3%). Tree crops with the least proportions are coffee (17.1%), pawpaw (17.0%), coconut (16.7%), mango (14.8%) and rubber (12.8%). It is in the cultivation of only two tree crops, that the proportion of females is higher than the average. Almost all tree crop holders employ mono-cropping system. About 97 percent cultivate only one tree crop per parcel (mono-cropping). The proportion of holders using mixed-cropping system vary significantly across the type of crops, ranging from 3.6 percent for cocoa to 72.8 percent among holders cultivating avocado. The two other crops with more than 50 percent of holders using mixed-cropping system are cola and banana (Table 9.1).

Cocoa is the most dominant tree crop, engaging 619,866 (80.9%) of the 765,885 holders followed distantly by cashew (11.7%) and oil-palm (11.3%), see Table 9.8.

For both males and females, mono-cropping is the dominant system used. This is the case across all types of tree crops, except for avocado and cola for which the proportion of holders using mono-cropping is less than mixed-cropping. In addition, among females cultivating guava and males cultivating banana, mixed-cropping is more dominant than mono-cropping system.

Table 9.8: Tree crop holders 15 years or older by type of crop, and by type of cropping system and sex

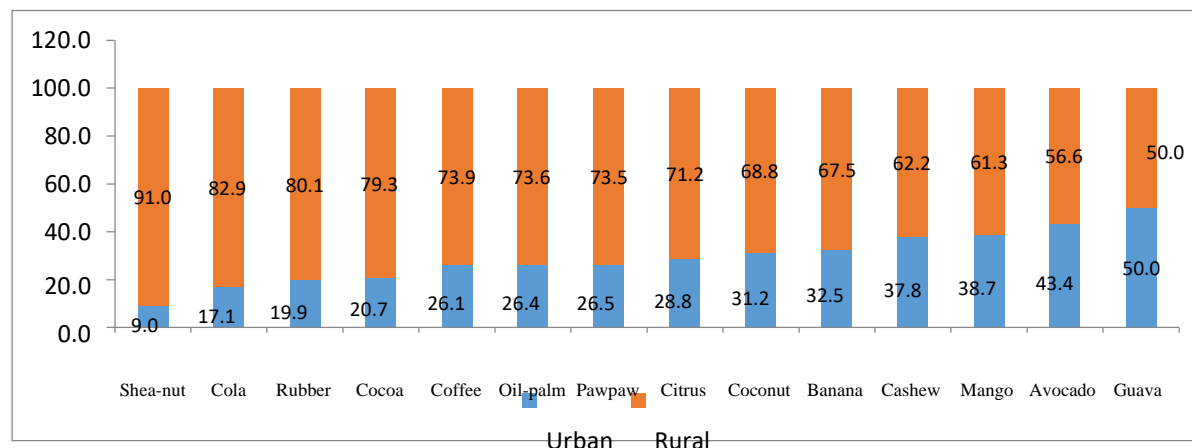
	Mono-cropping						Mixed-cropping						Total				
	Male	%	Female	%	Total	%	Male	%	Female	%	Total	%	Male	%	Female	%	Total
All holders	551,254	74.6	188,071	25.4	739,325	96.5	20,487	77.1	6,073	22.9	26,560	3.5	571,741	74.7	194,144	25.3	765,885
Avocado	613	74.8	207	25.2	820	27.2	1,778	81.2	413	18.8	2,191	72.8	2,391	79.4	620	20.6	3,011
Banana	2,710	71.1	1,103	28.9	3,813	43.7	3,896	79.2	1,022	20.8	4,918	56.3	6,606	75.7	2,125	24.3	8,731
Cashew	62,002	71.9	24,266	28.1	86,268	95.9	2,768	75.3	909	24.7	3,677	4.1	64,770	72.0	25,175	28.0	89,945
Cocoa	446,598	74.7	151,157	25.3	597,755	96.4	17,064	77.2	5,047	22.8	22,111	3.6	463,662	74.8	156,204	25.2	619,866
Coconut	6,669	83.6	1,313	16.4	7,982	77.0	1,964	82.5	418	17.5	2,382	23.0	8,633	83.3	1,731	16.7	10,364
Coffee	665	83.8	129	16.2	794	65.0	347	81.3	80	18.7	427	35.0	1,012	82.9	209	17.1	1,221
Cola	245	80.6	59	19.4	304	29.4	533	73.1	196	26.9	729	70.6	778	75.3	255	24.7	1,033
Citrus	10,968	79.3	2,862	20.7	13,830	80.8	2,681	81.7	601	18.3	3,282	19.2	13,649	79.8	3,463	20.2	17,112
Mango	3,808	87.1	565	12.9	4,373	79.7	866	77.8	247	22.2	1,113	20.3	4,674	85.2	812	14.8	5,486
Oil-palm	63,713	79.8	16,100	20.2	79,813	92.3	5,359	80.6	1,293	19.4	6,652	7.7	69,072	79.9	17,393	20.1	86,465
Guava	106	73.6	38	26.4	144	52.4	90	68.7	41	31.3	131	47.6	196	71.3	79	28.7	275
Pawpaw	1,019	83.7	198	16.3	1,217	65.2	530	81.5	120	18.5	650	34.8	1,549	83.0	318	17.0	1,867
Shea nut	223	76.9	67	23.1	290	78.8	70	89.7	8	10.3	78	21.2	293	79.6	75	20.4	368
Rubber	3,422	87.4	495	12.6	3,917	90.6	347	85.7	58	14.3	405	9.4	3,769	87.2	553	12.8	4,322

**The summation of responses of holders of the individual crops is more than the total number of holders because a holder may cultivate more than one type of crop.*

9.4 Tree crop holders and type of locality

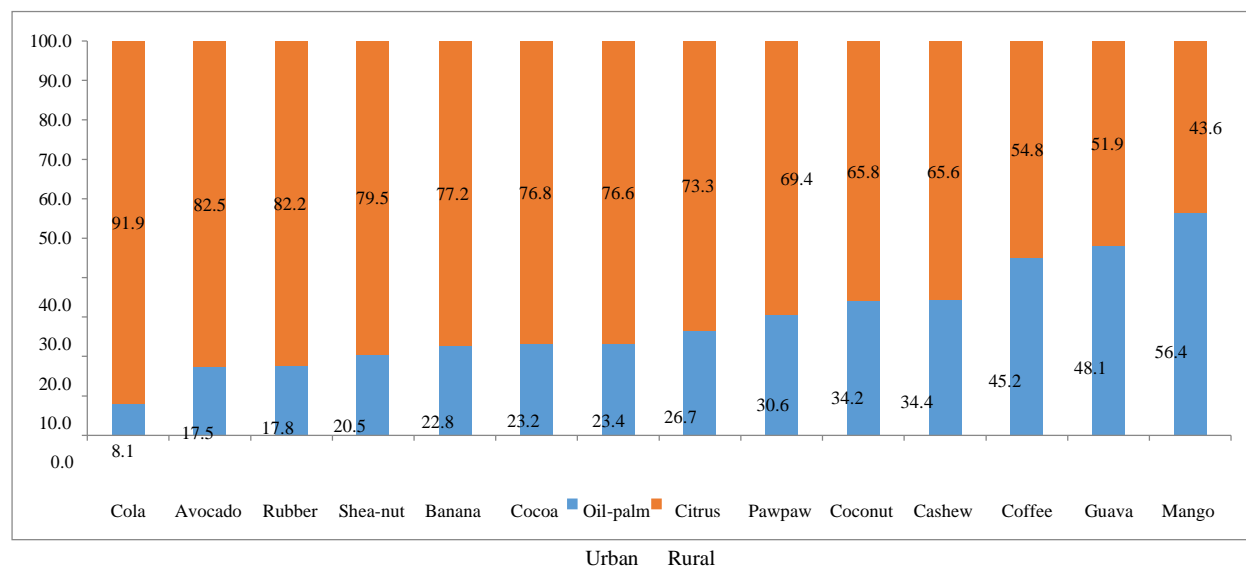
Using both mono- and mixed- cropping systems to cultivate each type of tree crop is a rural phenomenon (Figure 9.1 and Figure 9.2). Under mono-cropping system, rural holders constitute at least 50 percent (guava), see Figure 9.1.

Figure 9.1: Type of tree crop of holders 15 years or older using the mono-cropping system by type of locality (percent)



Under mixed-cropping, rural holders constitute at least 50 percent in the cultivation of all types of crops, except for mango (43.6%). In addition, for seven out of the 14 tree crops, at least three-quarters of the holders are in rural areas. (Figure 9.2).

Figure 9.2 Type of tree crop of holders 15 years or older using the mixed-cropping system by type of locality (percent)



9.5 Land parcels under tree crop cultivation

Ownership of parcels is the major type of land tenure arrangements used for the cultivation of tree crops and is mainly through freehold (56.6%) or inheritance (20.5%). This pattern, where ownership through freehold has the highest proportion of holders followed by inheritance is true for all types of tree crops except for shea nut, where inheritance has the highest proportion

followed by freehold. The next prevailing type of tenure is share-cropping where 16.5 percent

of holders are engaged in this tenure arrangement with the proportion for oil-palm (18.2%) and cocoa (17.9%) close to one-fifth (Table 9.9).

More than half of both male and female holders own their parcels. More females (59.6%) than males (55.7%) own their parcel through freehold and inheritance, while for share-cropping, male holders (18.5%) have a higher proportion of 8.3 percentage points difference.

A higher proportion of females (25.2%) than males (19.1%) own their parcels through inheritance and similarly for share-cropping arrangement (Table 9.9).

Table 9.9: Land parcels by sex of holder and type of tree crop, and by type of land tenure arrangement

Tree crop/tenure/sex	Own/ Free-holding	Inheritance	Lease-hold	Renting	Share-cropping	Squatting	Trustee-ship	Other	Total
Both sexes	569,645	206,739	31,597	15,843	166,366	2,771	12,652	709	1,006,322
%	56.6	20.5	3.1	1.6	16.5	0.3	1.3	0.1	100.0
Avocado	62.5	17.8	2.0	2.3	12.7	0.3	2.3	0.1	3,148
Banana	46.2	29.9	2.2	3.9	11.4	1.3	5.0	0.2	9,137
Cashew	64.2	23.9	1.8	2.7	6.5	0.4	0.5	0.0	95,136
Cocoa	56.5	20.1	3.0	1.0	17.9	0.2	1.2	0.1	795,614
Coconut	56.1	19.9	6.1	3.7	10.0	0.4	3.7	0.1	10,918
Coffee	46.6	34.5	1.7	2.4	10.7	0.2	4.0	0.0	1,265
Cola	44.7	37.1	2.0	1.0	13.3	0.6	1.4	0.0	1,173
Citrus	54.5	19.7	4.8	6.4	12.4	0.4	1.7	0.0	17,991
Mango	61.9	20.9	4.5	4.1	3.7	0.9	3.7	0.2	5,640
Oil-palm	49.8	21.9	4.6	3.3	18.2	0.5	1.6	0.1	92,213
Guava	66.5	13.4	0.4	2.8	9.5	0.4	7.0	0.0	284
Pawpaw	44.9	13.0	8.5	18.1	11.6	1.2	2.5	0.3	1,939
Shea nut	41.2	53.2	0.8	1.5	2.8	0.3	0.3	0.0	391
Rubber	57.5	16.2	8.7	2.3	12.5	0.3	2.5	0.0	4,572
Males holders	425,885	146,020	25,899	13,268	141,676	2,201	9,575	600	765,124
%	55.7	19.1	3.4	1.7	18.5	0.3	1.3	0.1	100.0
Avocado	62.0	16.7	2.1	2.3	14.0	0.3	2.6	0.1	2,506
Banana	45.7	28.3	2.2	4.2	13.2	1.3	4.9	0.2	6,942
Cashew	63.2	22.5	2.0	3.3	8.0	0.4	0.5	0.1	68,753
Cocoa	55.5	18.5	3.2	1.1	20.1	0.2	1.2	0.1	603,659
Coconut	56.5	19.5	6.1	4.0	10.6	0.5	2.8	0.1	9,094
Coffee	46.2	33.0	1.8	2.8	11.9	0.2	4.1	0.0	1,053
Cola	43.5	35.5	2.1	1.3	15.5	0.6	1.5	0.0	896
Citrus	54.5	18.7	4.8	6.2	13.5	0.4	1.8	0.0	14,362
Mango	62.4	20.4	4.7	4.4	4.0	1.0	2.9	0.2	4,812
Oil-palm	49.3	21.0	4.8	3.4	19.4	0.5	1.5	0.1	73,892
Guava	68.3	12.7	0.5	3.4	12.7	0.5	2.0	0.0	205
Pawpaw	43.4	12.3	9.2	18.7	12.4	1.4	2.4	0.2	1,617
Shea nut	40.0	53.7	1.0	1.6	3.5	0.0	0.3	0.0	315
Rubber	57.3	15.6	9.1	2.4	12.8	0.2	2.5	0.0	4,001
Female holders	143,760	60,719	5,698	2,575	24,690	570	3,077	109	241,198
%	59.6	25.2	2.4	1.1	10.2	0.2	1.3	0.0	100.0
Avocado	64.3	22.3	1.7	2.5	7.6	0.5	1.1	0.0	642
Banana	47.9	34.9	2.0	3.0	5.9	1.1	5.1	0.1	2,195
Cashew	66.8	27.5	1.1	1.1	2.7	0.3	0.5	0.0	26,383
Cocoa	59.4	24.9	2.3	0.7	11.1	0.2	1.2	0.0	191,955
Coconut	54.2	21.8	6.4	2.2	7.1	0.2	8.2	0.1	1,824
Coffee	48.6	41.5	0.9	0.5	4.7	0.0	3.8	0.0	212
Cola	48.4	42.2	1.4	0.0	6.1	0.7	1.1	0.0	277
Citrus	54.5	23.6	4.9	7.0	8.1	0.2	1.5	0.1	3,629
Mango	58.7	23.9	3.3	2.2	2.4	0.7	8.6	0.2	828
Oil-palm	52.1	25.5	4.0	2.9	13.4	0.5	1.6	0.1	18,321
Guava	62.0	15.2	0.0	1.3	1.3	0.0	20.3	0.0	79
Pawpaw	52.2	16.5	5.0	14.9	7.5	0.6	3.1	0.3	322
Shea nut	46.1	51.3	0.0	1.3	0.0	1.3	0.0	0.0	76
Rubber	59.0	20.1	6.0	1.6	10.0	1.1	2.3	0.0	571

9.6 Size of land parcels under tree crop cultivation

Approximately, 71 percent of all tree crops are cultivated on parcels that are less than 5 acres with slightly more than a third of parcel sizes less than 2 acres. Only 9.6 percent are at least 10 acres. Majority (between 50.6% and 73.9%) of the size of parcels used in the cultivation of eight out of the 14 tree crops are under 2 acres.

More than two-thirds of the size of parcels used for the cultivation of guava (73.9%) and shea nut (73.1%) are less than 2 acres. More than half (57.5%) of the parcels under cashew cultivation are less than 5 acres. Approximately, 71 percent of parcels used for cultivating cocoa are less than 5 acres and one in five (20.1%) are between 5 and 10 acres. (Table 9.10).

Cashew is one of the few crops with medium and large-scale parcels for cultivation. Hence, cashew has the lowest share (14.4%) of parcels less than 2 acres and has the most share of parcels of sizes 2 to 5 acres (42.6%), 5 to 10 acres (25.9%) and 10 acres or larger (17.1%). Cocoa, conversely, is cultivated on both small and medium parcel sizes with almost an equal proportion of parcels under 2 acres and 2 to 5 acres.

For parcels that are at least 10 acres, cashew (17.1%), rubber (14.1%) mango (11.7%) and avocado (10.4%) have the highest proportions.

Table 9.10: Land parcels by type of tree crop, and by land size (acres)

Area of crop production (acres)	< 2	2 - < 5	5 - < 10	10+	Total
Total	370,855	363,278	205,924	99,364	1,039,421
All tree crops	35.7	35.0	19.8	9.6	100.0
Avocado	43.4	27.7	18.5	10.4	3,148
Banana	54.9	27.1	12.6	5.4	9,137
Cashew	14.4	42.6	25.9	17.1	95,136
Cocoa	35.9	34.6	20.3	9.2	795,614
Coconut	63.8	23.0	8.2	5.0	10,918
Coffee	59.7	26.3	10.2	3.8	1,265
Cola	43.5	34.2	13.8	8.5	1,173
Citrus	56.6	27.2	10.5	5.6	17,991
Mango	52.3	25.1	10.9	11.7	5,640
Oil-palm	43.7	35.1	14.9	6.3	92,213
Guava	73.9	11.6	6.7	7.7	284
Pawpaw	49.4	28.9	14.0	7.8	1,939
Shea nut	73.1	15.3	6.9	4.6	391
Rubber	50.6	25.2	10.1	14.1	4,572

Three of the crops (cocoa, cashew and oil-palm) account for 95.0 percent of the total land area under cultivation of tree crops. The size of land under the cultivation of tree crops is 4,170,190 acres. Cocoa alone accounts for 75.4 percent of the total land area. Cashew is cultivated on 544,108 acres of land (13.0%) and oil-palm on 271,969 acres (6.5%). Cocoa takes up a higher proportion of cultivated land of tree crop (78.6%) in rural areas, and mango has the highest proportion for urban areas (54.9%). With the exception of shea nut (71.6%) and mango (54.9%), land under cultivation for tree crops are predominantly in rural areas with at least 58.6 percent of the land being used for the cultivation of other tree crops found in the rural areas (Table 9.11).

Table 9.11: Land parcels by type of tree crop, and by type of locality

Tree crop	Urban		Rural		Total
	Number	%	Number	%	
All parcels	1,043,238		3,126,978		4,170,216
Avocado	880	41.4	1,243	58.6	2,123
Banana	1,797	32.0	3,813	68.0	5,611
Cashew	212,801	39.1	331,308	60.9	544,108
Cocoa	673,473	21.4	2,471,609	78.6	3,145,082
Coconut	6,399	35.1	11,842	64.9	18,242
Coffee	616	31.0	1,374	69.0	1,990
Cola	235	27.4	622	72.6	857
Citrus	13,499	37.1	22,860	62.9	36,359
Mango	12,088	54.9	9,921	45.1	22,009
Oil-palm	88,951	32.7	183,018	67.3	271,969
Guava	56	22.7	191	77.3	247
Pawpaw	825	23.4	2,696	76.6	3,521
Shea nut	1,126	71.6	445	28.4	1,571
Rubber	7,375	33.1	14,895	66.9	22,269
multiple crops per parcel	23,116	24.5	71,142	75.5	94,258

9.7 Tree crop holders and use of selected inputs

9.7.1 Use of fertilizer in the cultivation of tree crops

A total of 324,905 representing 42.4 percent of tree crop holders use fertilizer. A higher proportion of holders cultivating rubber (55.7%), cocoa (49.7%) and avocado (44.2%) use fertilizer. Application of fertilizer in shea nut cultivation is relatively low (7.9%). A similar pattern of the use of fertilizer is observed for both male (8.5%) and female (5.3%) holders. (Table 9.12).

Table 9.12: Tree crop holders 15 years or older by sex and type of crop, and by use of fertilizer

Sex/ Tree crop	Fertilizer		Fertilizer		Total
	Use	%	Do Not Use	%	
All holders	324,905	42.4	440,980	57.6	765,885
Avocado	1,331	44.2	1,680	55.8	3,011
Banana	2,356	27.0	6,375	73.0	8,731
Cashew	5,892	6.6	84,053	93.4	89,945
Cocoa	307,973	49.7	311,893	50.3	619,866
Coconut	1,638	15.8	8,726	84.2	10,364
Coffee	226	18.5	995	81.5	1,221
Cola	315	30.5	718	69.5	1,033
Citrus	2,460	14.4	14,652	85.6	17,112
Mango	1,217	22.2	4,269	77.8	5,486
Oil-palm	13,661	15.8	72,804	84.2	86,465
Guava	41	14.9	234	85.1	275
Pawpaw	926	49.6	941	50.4	1,867
Shea nut	29	7.9	339	92.1	368
Rubber	2,408	55.7	1,914	44.3	4,322
Male holders	253,135	44.3	318,606	55.7	571,741
Avocado	1,119	46.8	1,272	53.2	2,391
Banana	1,952	29.5	4,654	70.5	6,606
Cashew	4,525	7.0	60,245	93.0	64,770
Cocoa	239,434	51.6	224,228	48.4	463,662
Coconut	1,446	16.7	7,187	83.3	8,633
Coffee	197	19.5	815	80.5	1,012
Cola	247	31.7	531	68.3	778
Citrus	2,078	15.2	11,571	84.8	13,649
Mango	1,057	22.6	3,617	77.4	4,674
Oil-palm	11,226	16.3	57,846	83.7	69,072
Guava	38	19.4	158	80.6	196
Pawpaw	793	51.2	756	48.8	1,549
Shea nut	25	8.5	268	91.5	293
Rubber	2,133	56.6	1,636	43.4	3,769
Female holders	71,770	37.0	122,374	63.0	194,144
Avocado	212	34.2	408	65.8	620
Banana	404	19.0	1,721	81.0	2,125
Cashew	1,367	5.4	23,808	94.6	25,175
Cocoa	68,539	43.9	87,665	56.1	156,204
Coconut	192	11.1	1,539	88.9	1,731
Coffee	29	13.9	180	86.1	209
Cola	68	26.7	187	73.3	255
Citrus	382	11.0	3,081	89.0	3,463
Mango	160	19.7	652	80.3	812
Oil-palm	2,435	14.0	14,958	86.0	17,393
Guava	3	3.8	76	96.2	79
Pawpaw	133	41.8	185	58.2	318
Shea nut	4	5.3	71	94.7	75
Rubber	275	49.7	278	50.3	553

9.7.2 Use of pesticides in the cultivation of tree crops

The use of pesticide is generally higher (more than 60%) for the cultivation of tree crops except for shea nut (20.9%), guava (40.0%) and coconut (47.7%). About 88 percent of tree crop holders use pesticides. In the case of holders cultivating cocoa, 91.5 percent use pesticides. For the others, at least three-quarters of holders cultivating cashew (81.6%), pawpaw (76.8%), avocado (76.0%) and rubber (75.4%) use pesticides.

About the same proportions of male (88.4%) and female (86.2%) holders use pesticides. Across all types of crops, the use of pesticide is higher for males than females except for shea nut and rubber. A relatively higher proportion of male holders of cocoa (92.1%) than their female counterparts (89.8%) use pesticides. In contrast, more female holders of rubber (76.1%) and shea nut (26.7%) use pesticides than their male counterparts (75.3% and 19.5% respectively).

The use of pesticides is significantly higher relative to the use of fertilizer in the cultivation of tree crops. (Table 9.13).

Table 9.13: Tree crop holders 15 years or older by sex and type of crop, and by use of pesticides

Sex/Tree crop	Use		Do Not Use		Total
	Number	%	Number	%	
All holders	672,433	87.8	93,452	12.2	765,885
Avocado	2,288	76.0	723	24.0	3,011
Banana	5,703	65.3	3,028	34.7	8,731
Cashew	73,407	81.6	16,538	18.4	89,945
Cocoa	567,129	91.5	52,737	8.5	619,866
Coconut	4,946	47.7	5,418	52.3	10,364
Coffee	749	61.3	472	38.7	1,221
Cola	688	66.6	345	33.4	1,033
Citrus	10,558	61.7	6,554	38.3	17,112
Mango	3,547	64.7	1,939	35.3	5,486
Oil-palm	55,685	64.4	30,780	35.6	86,465
Guava	110	40.0	165	60.0	275
Pawpaw	1,433	76.8	434	23.2	1,867
Shea nut	77	20.9	291	79.1	368
Rubber	3,259	75.4	1,063	24.6	4,322
Male holders	505,147	88.4	66,594	11.6	571,741
Avocado	1,872	78.3	519	21.7	2,391
Banana	4,507	68.2	2,099	31.8	6,606
Cashew	52,982	81.8	11,788	18.2	64,770
Cocoa	426,909	92.1	36,753	7.9	463,662
Coconut	4,251	49.2	4,382	50.8	8,633
Coffee	647	63.9	365	36.1	1,012
Cola	527	67.7	251	32.3	778
Citrus	8,687	63.6	4,962	36.4	13,649
Mango	3,110	66.5	1,564	33.5	4,674
Oil-palm	45,008	65.2	24,064	34.8	69,072
Guava	92	46.9	104	53.1	196
Pawpaw	1,222	78.9	327	21.1	1,549
Shea nut	57	19.5	236	80.5	293
Rubber	2,838	75.3	931	24.7	3,769
Female holders	167,286	86.2	26,858	13.8	194,144
Avocado	416	67.1	204	32.9	620
Banana	1,196	56.3	929	43.7	2,125
Cashew	20,425	81.1	4,750	18.9	25,175
Cocoa	140,220	89.8	15,984	10.2	156,204
Coconut	695	40.2	1,036	59.8	1,731
Coffee	102	48.8	107	51.2	209
Cola	161	63.1	94	36.9	255
Citrus	1,871	54.0	1,592	46.0	3,463
Mango	437	53.8	375	46.2	812
Oil-palm	10,677	61.4	6,716	38.6	17,393
Guava	18	22.8	61	77.2	79
Pawpaw	211	66.4	107	33.6	318
Shea nut	20	26.7	55	73.3	75
Rubber	421	76.1	132	23.9	553

9.7.3 Use of irrigation in the cultivation of tree crops

The use of irrigation facility is relatively low compared with the use of pesticides and fertilizer in the production of tree crops. Tree crop holders who use fully controlled irrigation in the cultivation of crops is low (3.4%). Partially controlled irrigation is also low among tree crop holders (4.9%) and about 92 percent of holders do not use irrigation at all. Holders of pawpaw represent the highest users of irrigation comprising fully and partially controlled irrigation (27%), followed by rubber tree holders (12.5%), see Table 9.14.

Table 9.14: Tree crop holders 15 years or older by sex and type of crop, and by use of irrigation

Sex/ Tree crop	Use, fully controlled		Use, partially controlled		Do Not Use		Total
	Number	%	Number	%	Number	%	
Both sexes							
Total	26,143	3.4	37,841	4.9	701,901	91.6	765,885
Avocado	52	1.7	91	3.0	2,868	95.3	3,011
Banana	176	2.0	345	4.0	8,210	94.0	8,731
Cashew	1,106	1.2	2,164	2.4	86,675	96.4	89,945
Cocoa	22,123	3.6	31,536	5.1	566,207	91.3	619,866
Coconut	257	2.5	432	4.2	9,675	93.4	10,364
Coffee	22	1.8	15	1.2	1,184	97.0	1,221
Cola	13	1.3	28	2.7	992	96.0	1,033
Citrus	370	2.2	906	5.3	15,836	92.5	17,112
Mango	259	4.7	353	6.4	4,874	88.8	5,486
Oil-palm	3,434	4.0	4,663	5.4	78,368	90.6	86,465
Guava	8	2.9	10	3.6	257	93.5	275
Pawpaw	214	11.5	290	15.5	1,363	73.0	1,867
Shea nut	7	1.9	7	1.9	354	96.2	368
Rubber	254	5.9	286	6.6	3,782	87.5	4,322
Male							
Total	20,328	3.6	29,280	5.1	522,133	91.3	571,741
Avocado	38	1.6	71	3.0	2,282	95.4	2,391
Banana	135	2.0	254	3.8	6,217	94.1	6,606
Cashew	845	1.3	1,720	2.7	62,205	96.0	64,770
Cocoa	17,170	3.7	24,294	5.2	422,198	91.1	463,662
Coconut	215	2.5	362	4.2	8,056	93.3	8,633
Coffee	19	1.9	14	1.4	979	96.7	1,012
Cola	11	1.4	22	2.8	745	95.8	778
Citrus	311	2.3	731	5.4	12,607	92.4	13,649
Mango	215	4.6	296	6.3	4,163	89.1	4,674
Oil-palm	2,701	3.9	3,765	5.5	62,606	90.6	69,072
Guava	4	2.0	9	4.6	183	93.4	196
Pawpaw	180	11.6	230	14.8	1,139	73.5	1,549
Shea nut	7	2.4	7	2.4	279	95.2	293
Rubber	216	5.7	258	6.8	3,295	87.4	3,769
Female							
Total	5,815	3.0	8,561	4.4	179,768	92.6	194,144
Avocado	14	2.3	20	3.2	586	94.5	620
Banana	41	1.9	91	4.3	1,993	93.8	2,125
Cashew	261	1.0	444	1.8	24,470	97.2	25,175
Cocoa	4,953	3.2	7,242	4.6	144,009	92.2	156,204
Coconut	42	2.4	70	4.0	1,619	93.5	1,731
Coffee	3	1.4	1	0.5	205	98.1	209
Cola	2	0.8	6	2.4	247	96.9	255
Citrus	59	1.7	175	5.1	3,229	93.2	3,463
Mango	44	5.4	57	7.0	711	87.6	812
Oil-palm	733	4.2	898	5.2	15,762	90.6	17,393
Guava	4	5.1	1	1.3	74	93.7	79
Pawpaw	34	10.7	60	18.9	224	70.4	318
Shea nut	0	0.0	0	0.0	75	100.0	75
Rubber	38	6.9	28	5.1	487	88.1	553

9.7.4 Ownership of nurseries in the cultivation of tree crops

Less than 28 percent of tree crop holders own nurseries. Holders of pawpaw have the highest proportion of nurseries (32.8%), followed by cocoa (28.9%) and oil-palm (26.4%). Shea nut holders own the lowest proportion of nurseries (7.9%). This pattern is also observed for both male and female holders, although a higher proportion of male holders than female own nurseries in all crops except cola (Table 9.15).

Table 9.15: Tree crop holders 15 years or older by sex and type of crop, and by availability of nursery

Sex/ Tree crop	Owned		Do not own		Total
	Number	%	Number	%	
All holders	208,792	27.3	557,093	72.7	765,885
Avocado	735	24.4	2276	75.6	3011
Banana	1,559	17.9	7172	82.1	8731
Cashew	11,447	12.7	78498	87.3	89945
Cocoa	179,238	28.9	440628	71.1	619866
Coconut	1,852	17.9	8512	82.1	10364
Coffee	203	16.6	1018	83.4	1221
Cola	238	23.0	795	77.0	1033
Citrus	3,600	21.0	13512	79.0	17112
Mango	1,000	18.2	4486	81.8	5486
Oil-palm	22,838	26.4	63627	73.6	86465
Guava	45	16.4	230	83.6	275
Pawpaw	612	32.8	1255	67.2	1867
Shea nut	29	7.9	339	92.1	368
Rubber	944	21.8	3378	78.2	4322
Male holders	161,990	28.3	409,751	71.7	571,741
Avocado	607	25.4	1,784	74.6	2,391
Banana	1,281	19.4	5,325	80.6	6,606
Cashew	8,989	13.9	55,781	86.1	64,770
Cocoa	138,406	29.9	325,256	70.1	463,662
Coconut	1,586	18.4	7,047	81.6	8,633
Coffee	181	17.9	831	82.1	1,012
Cola	175	22.5	603	77.5	778
Citrus	2,957	21.7	10,692	78.3	13,649
Mango	855	18.3	3,819	81.7	4,674
Oil-palm	18,632	27.0	50,440	73.0	69,072
Guava	37	18.9	159	81.1	196
Pawpaw	516	33.3	1,033	66.7	1,549
Shea nut	24	8.2	269	91.8	293
Rubber	845	22.4	2,924	77.6	3,769
Female holders	46,802	24.1	147,342	75.9	194,144
Avocado	128	20.6	492	79.4	620
Banana	278	13.1	1,847	86.9	2,125
Cashew	2,458	9.8	22,717	90.2	25,175
Cocoa	40,832	26.1	115,372	73.9	156,204
Coconut	266	15.4	1,465	84.6	1,731
Coffee	22	10.5	187	89.5	209
Cola	63	24.7	192	75.3	255
Citrus	643	18.6	2,820	81.4	3,463
Mango	145	17.9	667	82.1	812
Oil-palm	4,206	24.2	13,187	75.8	17,393
Guava	8	10.1	71	89.9	79
Pawpaw	96	30.2	222	69.8	318
Shea nut	5	6.7	70	93.3	75
Rubber	99	17.9	454	82.1	553

9.8 Tree crop holders in ecological zones

Tree crop holders are mostly found in the forest zone (86.8%) which accounts for the share of more than 50 percent of all types of crops, except for mango (34.8%), cashew (17.5%) and shea nut (13.3%). Tree crops that have more than 90 percent of holders in the forest zone are cocoa (96.8%), cola (96.7%), coffee (92.6%), banana (91.3%), oil-palm (90.9%) and rubber (90.6%). Shea nut holders (76.9%) are mostly found in the northern savannah while cashew holders (71.6%) are mostly found in the transitional zone. The share of coastal savannah holders is generally less than 40 percent for all crop types and less than 2 percent for four of the crops (cashew, cocoa, coffee and cola), see Table 9.16.

Table 9.16: Tree crop holders 15 years or older by type of crop, and by agro-ecological zone

Tree crop	Coastal Savannah	Forest	Transitional zone	Northern Savannah	Total
Total	19,809	664,739	69,483	11,854	765,885
All holders	2.6	86.8	9.1	1.5	
Avocado	8.1	88.1	2.7	1.1	3,011
Banana	6.8	91.3	1.1	0.8	8,731
Cashew	0.4	17.5	71.6	10.6	89,945
Cocoa	1.3	96.8	1.8	0.1	619,866
Coconut	16.6	82.4	0.8	0.2	10,364
Coffee	1.6	92.6	5.1	0.7	1,221
Cola	1.6	96.7	0.4	1.3	1,033
Citrus	22.2	75.2	2.3	0.3	17,112
Mango	25.2	34.8	11.8	28.1	5,486
Oil-palm	7.9	90.9	0.7	0.5	86,465
Guava	38.2	51.3	0.7	9.8	275
Pawpaw	16.2	78.9	1.8	3.1	1,867
Shea nut	8.7	13.3	1.1	76.9	368
Rubber	8.8	90.6	0.4	0.1	4,322

9.9 Production of tree crops

A total of 4,316,450.3 mts of tree crops were produced in the reference period out of which 90.4 percent (3,901,279.9 mts) were sold. Holders in the urban localities produced 1,355,205.5 mts (31.4%) out of the total output. Oil-palm (1,517,327 mts; 35.2%) and cocoa (1,130,137 mts; 26%) together accounted for 68.6 percent of all the tree crop output. Citrus (683,718.3 mts) and coconut (464,141.7 mts) were the next highest output produced by tree crop holders. The quantity of tree crops produced by holders in rural localities was more than their counterparts in the urban localities except for avocado and mango production (Table 9.17).

Table 9.17: Quantity (mts) by type of crop, and by quantity produced, quantity sold, cost of production (GHC) and scale of production

Type of tree	Production (mts)				Sales(mts)				Cost of production ('000 GHC)				N
crop	Small	Medium	Large	(mts)	Small	Medium	Large	(mts)	Small	Medium	Large		
Total	800,564	898,705	2,617,182	4,316,450	714,272	811,446	2,375,562	3,901,280	238,929	285,739	588,961	1,113,629	
Avocado	18.5	20.8	60.7	100	18.3	20.8	60.9	4,065	21.5	25.7	52.8	730	
Banana	27.7	17.3	55.0	98,968	30.1	17.6	52.3	88,264	22.5	25.2	52.3	4,007	
Cashew	33.1	21.5	45.4	160,933	33.8	21.2	45.0	156,843	40.3	20.5	39.2	81,918	
Cocoa	8.5	21.4	70.1	1,130,137	8.2	21.3	70.5	1,122,665	9.9	23.5	66.6	915,084	
Coconut	11.1	21.9	67.0	464,142	11.1	21.9	67.0	390,901	22.1	26.0	51.9	8,738	
Coffee	49.8	21.4	28.8	683	50.7	23.3	26.0	662	30.8	30.2	39.0	468	
Cola	20.0	20.1	59.9	454	19.7	20.0	60.3	415	24.6	22.6	52.8	229	
Citrus	10.6	24.5	64.9	683,718	10.9	25.0	64.1	610,963	24.9	22.7	52.4	12,835	
Mango	23.4	21.6	55.0	134,563	23.6	21.9	54.5	111,813	29.3	21.8	48.9	6,763	
Oil-palm	13.2	23.2	63.6	1,517,327	12.3	23.7	64.0	1,305,660	18.6	17.4	64.0	74,184	
Guava	12.4	18.8	68.8	1,628	12.4	18.1	69.5	1,568	21.7	24.5	53.8	95	
Pawpaw	20.5	20.6	58.9	35,760	20.0	21.3	58.7	32,394	27.4	18.1	54.5	1,419	
Shea nut	28.4	24.1	47.5	10,439	30.3	19.7	50.0	9,644	31.7	27.5	40.8	130	
Rubber	25.5	8.7	65.8	73,080	23.5	6.1	70.4	65,423	26.2	5.7	68.1	7,027	

A total of 2,617,182.1 mts of tree crops, representing 60.6 percent, are was cultivated on parcels that are 5 acres or larger in size (large-scale) of which 90.8 percent (2,375,562.0 mts) was sold. Further, 18.5 percent (800,563 mts) of tree crops grown on parcels less than 2 acres sold by 89.2 percent (714,271.5 mts). More than two-thirds of oil-palm (68.7%) and cocoa (67.0%) were produced on parcels that are 5 acres or larger. Similar patterns are observed among holders who dwell in urban or rural localities (Table 9.18).

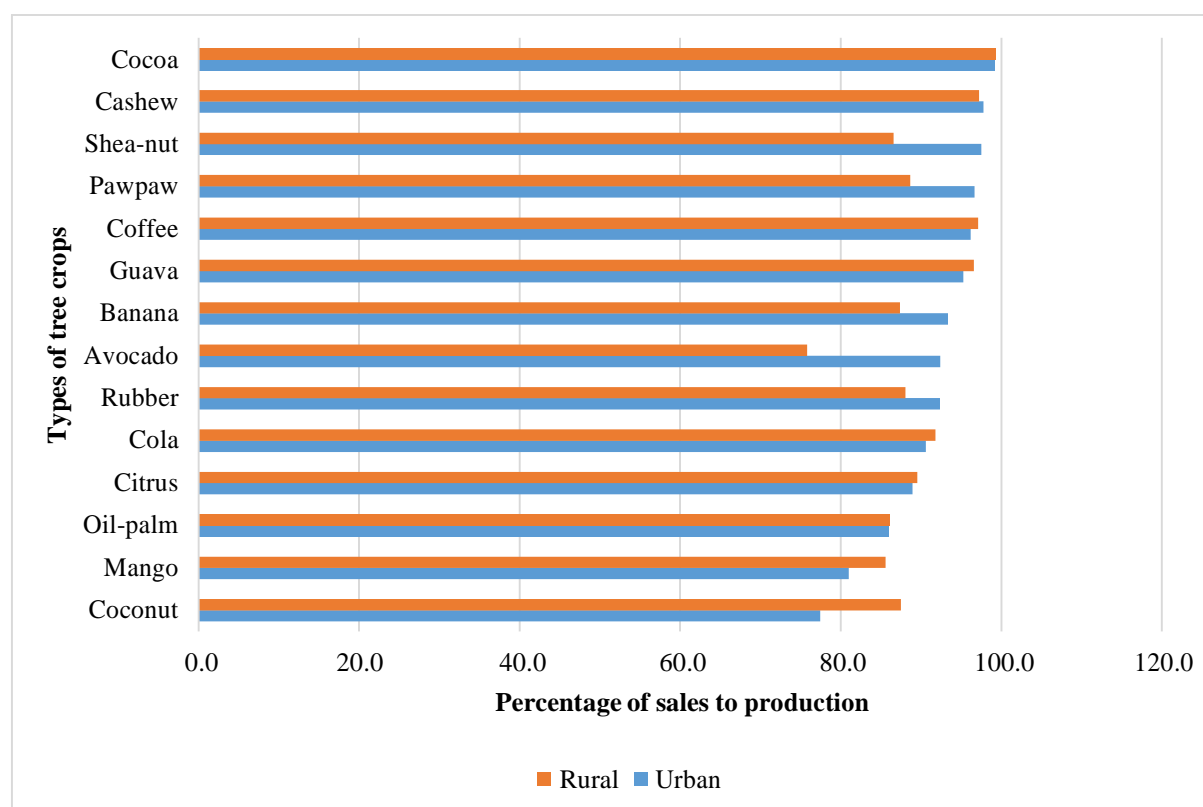
Table 9.18: Quantity (mts) by type of locality and type of tree crop, and by quantity produced, quantity sold and cost of production (GHC) and scale of production

holder/ Type of tree	Cost of production ('000											
	Production (mts)				Sale(mts)s				GHC)			
	Number				Number							
	Small	Medium	Large	((mts))	Small	Medium	Large	((mts))	Small	Medium	Large	N
Urban	189,629	263,368	902,209	1,355,206	170,844	233,889	794,923	1,199,656	52,306	67,019	148,640	267,966
Total	14.0	19.4	66.6		14.2	19.5	66.3		19.5	25.0	55.5	
Avocado	30.1	15.2	54.7	3,395	31.9	15.5	52.6	3,137	14.0	25.1	60.9	328
Banana	27.7	19.6	52.7	30,102	27.9	18.0	54.1	28,098	33.0	22.3	44.7	985
Cashew	8.8	20.5	70.7	65,352	8.3	20.6	71.1	63,918	9.1	22.4	68.5	34,997
Cocoa	11.0	20.9	68.1	238,881	11.0	20.9	68.1	236,840	21.6	25.7	52.7	192,827
Coconut	34.8	21.8	43.4	151,155	40.2	24.8	35.0	117,097	30.5	26.1	43.4	2,618
Coffee	21.2	18.1	60.7	236	21.8	17.7	60.5	227	21.5	14.5	64.0	150
Cola	2.9	37.4	59.7	149	3.1	41.4	55.5	135	17.3	31.9	50.8	72
Citrus	17.2	20.8	62.0	201,162	17.6	21.7	60.7	178,885	21.4	23.3	55.3	4,215
Mango	7.2	28.4	64.4	73,207	6.2	30.2	63.6	59,294	14.5	14.9	70.6	3,681
Oil-palm	9.5	16.7	73.8	552,015	9.5	15.8	74.7	474,829	17.1	24.5	58.4	25,875
Guava	54.3	23.7	22.0	338	52.8	24.7	22.5	322	31.6	36.6	31.8	36
Pawpaw	9.9	10.8	79.3	8,643	9.2	10.8	80.0	8,355	22.3	20.4	57.3	384
Shea nut	4.0	1.6	94.4	5,553	1.6	1.6	96.8	5,414	14.6	2.5	82.9	49
Rubber	8.1	17.5	74.4	25,017	8.6	16.6	74.6	23,105	15.2	30.6	54.2	1,750
Rural	610,935	635,337	1,714,973	2,961,245	543,428	577,557	1,580,639	2,701,624	186,623	218,720	440,320	845,663
Total	20.6	21.5	57.9		20.1	21.4	58.5		22.1	25.9	52.0	
Avocado	21.0	23.1	55.9	1,224	23.8	24.9	51.3	928	29.4	25.3	45.3	403
Banana	35.5	22.3	42.2	68,867	36.5	22.7	40.8	60,166	42.7	19.9	37.4	3,021
Cashew	8.4	22.0	69.6	95,580	8.1	21.8	70.1	92,925	10.5	24.2	65.3	46,921
Cocoa	11.1	22.2	66.7	891,255	11.1	22.2	66.7	885,825	22.3	26.0	51.7	722,258
Coconut	57.1	21.2	21.7	312,986	55.3	22.6	22.1	273,804	31.0	31.9	37.1	6,120
Coffee	19.3	21.1	59.6	448	18.7	21.1	60.2	435	26.1	26.5	47.4	318
Cola	14.4	18.2	67.4	305	14.7	17.1	68.2	280	28.4	18.5	53.1	157
Citrus	25.9	21.9	52.2	482,556	26.1	22.0	51.9	432,077	33.1	21.1	45.8	8,620
Mango	20.4	17.0	62.6	61,357	19.2	16.5	64.3	52,519	23.6	20.4	56.0	3,082
Oil-palm	14.1	20.0	65.9	965,312	14.0	19.5	66.5	830,831	24.1	24.4	51.5	48,309
Guava	11.7	19.8	68.5	1,290	11.5	20.4	68.1	1,246	24.9	7.0	68.1	59
Pawpaw	34.3	28.3	37.4	27,117	37.6	22.8	39.6	24,039	35.2	30.1	34.7	1,036
Shea nut	50.0	16.7	33.3	4,886	51.5	11.9	36.6	4,230	33.2	7.6	59.2	82
Rubber	30.9	33.0	36.0	48,063	31.7	30.1	38.2	42,318	29.2	35.6	35.1	5,277

Proportion of quantity sold to production

At least 80 percent of tree crops produced were sold. Holders in both rural and urban areas cultivating cocoa, cashew, coffee and guava sold almost all (more than 95%) of the quantity produced. Holders in rural areas who produced avocado as well as holders in the urban areas who produced coconut sold less than 80 percent of their produce.

Figure 9.3. Proportion of quantity sold to quantity produced of types of tree crop by type of locality (percent)



CHAPTER TEN

LIVESTOCK

10.1 Introduction

This chapter presents results on livestock by providing information on livestock holders, livestock housing, animal husbandry practices, livestock off-take (own consumption, sales, losses, theft, gifts, sacrifices and deaths), purpose of production, quantity produced and cost of production.

10.2 Socio-demographic characteristics of livestock holders

10.2.1 Age and sex of livestock holders

The participation of young holders (less than 30 years) in livestock production is minimal. About eight in ten (79.8%) of holders engaged in livestock rearing are 30 years or older for all types of livestock for both males and females and in urban and rural areas.

More than 50 percent of livestock holders are in the age group of 36-59 years while holders who are 60 years or older range from 14.7 percent among holders in urban areas rearing non-ruminants to 22.1 percent among holders in urban areas rearing ruminants for all types of livestock. A similar pattern is observed for males and females for all types of livestock. The proportion of livestock holders 36 years or older are higher for females than males for all types of livestock (Table 10.1).

Table 10.1: Livestock holders 15 years or older by sex and age, and by categories of livestock and type of locality

Livestock and type of locality											
Age	Ruminants		Non-ruminants		Non-traditional livestock		Poultry		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
group	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both											
Sexes	46,469	173,878	5,149	16,244	2,065	2,763	36,867	137,030	75,882	248,816	324,698
15-19	0.2	0.3	0.2	0.2	2.0	1.1	0.2	0.3	0.3	0.3	0.3
20-24	1.0	1.6	1.1	2.1	3.5	2.6	1.1	1.6	1.1	1.6	1.5
25-29	4.3	5.2	6.6	6.6	7.4	7.7	4.7	5.9	17.6	18.8	18.5
30-35	12.0	12.5	15.4	14.9	15.7	14.0	13.2	13.8	10.0	10.3	10.3
36-59	60.4	58.1	62.1	58.7	54.6	56.1	61.1	58.3	50.5	48.0	48.6
60+	22.1	22.4	14.7	17.5	16.9	18.4	19.7	20.2	20.5	21.0	20.9
Male	38,275	151,320	4,384	13,580	1,853	2,539	25,978	113,932	58,052	207,744	265,796
15-19	0.2	0.3	0.2	0.2	2.2	1.1	0.3	0.3	0.3	0.3	0.3
20-24	1.1	1.7	1.2	2.3	3.5	2.8	1.2	1.7	1.2	1.7	1.6
25-29	4.7	5.7	7.1	7.5	7.7	8.2	5.1	6.5	19.0	20.3	20.0
30-35	13.0	13.4	16.5	16.1	16.4	14.2	14.2	14.7	10.8	10.9	10.9
36-59	61.0	58.0	62.0	58.0	53.5	55.8	62.2	58.3	50.5	47.4	48.1
60+	19.9	21.0	13.1	15.9	16.8	17.8	17.0	18.6	18.2	19.4	19.1
Female	8,194	22,558	765	2,664	212	224	10,889	23,098	17,830	41,072	58,902
15-19	0.1	0.1	0.0	0.1	0.5	0.9	0.2	0.1	0.1	0.1	0.1
20-24	0.5	0.7	0.5	0.8	3.8	0.4	0.7	0.9	0.7	0.8	0.8
25-29	2.4	2.2	3.9	2.4	4.7	3.1	3.9	3.4	12.8	11.2	11.7
30-35	7.0	6.9	9.2	8.6	9.4	11.2	10.7	9.3	6.3	6.1	6.2
36-59	57.4	58.6	62.9	62.2	64.2	59.4	58.5	58.2	51.8	52.3	52.1
60+	32.6	31.6	23.5	25.9	17.5	25.0	26.0	28.1	28.3	29.5	29.1

10.2.2 Youth holders in livestock

Most of the youth holders are in the age group of 25-35 years for all types of livestock. Majority of livestock youth holders (15-35 years) are males. At least 20 percent of livestock holders are youth except for livestock holders in the urban areas engaged in ruminant and poultry where the proportion of youth is less than 20 percent. There are higher proportions of youth among non-traditional livestock holders in urban (28.6%) and rural (25.5%) areas.

With the exception of youth in urban areas engaged in poultry where the proportion of male youth is 76.2 percent, the proportion of male youth engaged in all types of livestock in both urban and rural areas is about 90 percent or more. (Table 10.2).

Table 10.2: Livestock holders 15-35 years (youth) by sex and age, and by categories of livestock and type of locality

Age group	Ruminants		Non-ruminants		Non-traditional livestock		Poultry	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
All holders	46,469	173,878	5,149	16,244	2,065	2,763	36,867	137,030
Both sexes	8,116	34,010	1,106	3,865	500	704	7,084	29,539
15-19	86	439	8	33	41	31	90	373
20-24	480	2,703	55	338	73	73	389	2,143
25-29	1,992	9,090	341	1,078	152	214	1,749	8,129
30-35	5,558	21,787	792	2,416	324	386	4,856	18,894
Youth								
15-24	566	3,142	63	371	114	104	479	2,516
15-24	8,116	34,019	1,196	3,865	590	704	7,084	29,539
Male	7,298	31,796	1,092	3,548	551	669	5,396	26,375
15-19	78	408	8	30	40	29	71	341
20-24	436	2,550	51	317	65	72	311	1,927
25-29	1,797	8,602	311	1,015	142	207	1,325	7,353
30-35	4,987	20,236	722	2,186	304	361	3,689	16,754
Youth								
15-24	514	2,958	59	347	105	101	382	2,268
15-35	7,298	31,796	1,092	3,548	551	669	5,396	26,375
Female	818	2,223	104	317	39	35	1,688	3,164
15-19	8	31		3	1	2	19	32
20-24	44	153	4	21	8	1	78	216
25-29	195	488	30	63	10	7	424	776
30-35	571	1,551	70	230	20	25	1,167	2,140
Youth								
15-24	52	184	4	24	9	3	97	248
15-24	818	2,223	104	317	39	35	1,688	3,164
Percent of population (%)								
15-24	1.2	1.8	1.2	2.3	5.5	3.8	1.3	1.8
15-35	17.5	19.6	23.2	23.8	28.6	25.5	19.2	21.6
Sex composition								
Youth 15-24	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male	90.8	94.1	93.7	93.5	92.1	97.1	79.7	90.1
Female	9.2	5.9	6.3	6.5	7.9	2.9	20.3	9.9
Youth 15-35	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male	89.9	93.5	91.3	91.8	93.4	95.0	76.2	89.3
Female	10.1	6.5	8.7	8.2	6.6	5.0	23.8	10.7

10.2.3 Education of livestock holders

About 52 percent of livestock holders do not have formal education, 33.8 percent have attained basic education and 14.4 percent have at least secondary/vocational education. The proportion of female holders with basic education (39.3%) is 6.6 percentage points higher than their male counterparts. Also, in urban areas, the proportion of livestock holders with basic education is

8.5 percentage points higher than the evidence in rural areas. Educational attainment beyond basic level is low among females in both rural and urban areas compared to males. (Table 10.3).

Table 10.3: Livestock holders 15 years or older by sex and educational attainment, and by type of locality

Educational attainment/ Sex of holder	Urban		Rural		Total	
	Number	Percent	Number	Percent	Number	Percent
Both Sexes	75,882	100.0	266,333	100.0	346,180	100.0
Never attended	22,791	30.0	154,060	57.8	179,419	51.8
Basic education	30,786	40.6	85,331	32.0	117,311	33.9
Secondary/vocational	10,781	14.2	15,847	6.0	26,784	7.7
Post-secondary diploma	1,178	1.6	1,182	0.4	2,365	0.7
Tertiary	10,346	13.6	9,913	3.7	20,301	5.9
Male	58,052	100.0	223,537	100.0	285,093	100.0
Never attended	15,778	27.2	128,674	57.6	146,754	51.5
Basic education	22,544	38.8	69,756	31.2	93,323	32.7
Secondary/vocational	9,364	16.1	14,732	6.6	24,237	8.5
Post-secondary diploma	1,015	1.7	1,057	0.5	2,076	0.7
Tertiary	9,351	16.1	9,318	4.2	18,703	6.6
Female	17,830	100.0	42,796	100.0	61,087	100.0
Never attended	7,013	39.3	25,386	59.3	32,665	53.5
Basic education	8,242	46.2	15,575	36.4	23,988	39.3
Secondary/vocational	1,417	7.9	1,115	2.6	2,547	4.2
Post-secondary diploma	163	0.9	125	0.3	289	0.5
Tertiary	995	5.6	595	1.4	1,598	2.6

About 56 percent of holders who rear ruminants have never attended school and a little above three in every ten (31.4%) holders of ruminants have attained basic education. Relative to ruminants, non-ruminants and poultry livestock, educational level of urban holders in non-traditional livestock rearing is higher. For urban females engaged in non-traditional livestock, educational level higher than basic, constitute more than a third of female non-traditional livestock holders, and for urban males, about 56 percent. In contrast, 78.7 percent of female holders in the rural areas engaged in the rearing of non-ruminant livestock have never attended school. (Table10.4).

Table 10.4: Livestock holders 15 years or older by sex and educational attainment, and by categories of livestock and type of locality

Educational attainment/ Sex of holder	Ruminants			Non-ruminants			Non-traditional livestock			Poultry						
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All				
Both Sexes	46,444	173,829	220,273	220,273	5,148	16,239	21,387	21,387	2,065	2,759	4,824	4,824	36,845	136,921	173,766	173,766
Never attended	35.2	61.2	55.7	122,737	19.6	54.8	46.3	9,903	8	27.1	19	915	25.8	54.5	48.4	84,154
Basic education	38.5	29.5	31.4	69,191	43.6	31.3	34.2	7,325	38.3	46.7	43.1	2,080	42.6	34.9	36.5	63,452
Secondary/vocational	13.1	5.5	7.1	15,717	17.1	8.4	10.5	2,249	24.8	13.7	18.5	891	14.8	6.2	8	13,894
Post-secondary diploma	1.4	0.4	0.6	1,384	2	0.4	0.8	178	2.7	1.1	1.8	85	1.6	0.5	0.7	1,239
Tertiary	11.7	3.3	5.1	11,244	17.7	5.1	8.1	1,732	26.2	11.3	17.7	853	15.2	4	6.3	11,027
Male	38,254	151,272	189,526	189,526	4,383	13,575	17,958	17,958	1,853	2,535	4,388	4,388	25,960	113,834	139,794	139,794
Never attended	32.8	61.3	55.5	105,272	14.4	50.1	41.4	7,427	6.4	25.3	17.3	761	22.6	54.2	48.3	67,577
Basic education	37.8	28.6	30.4	57,710	45.2	33.9	36.6	6,580	37.9	47.2	43.3	1,898	39.3	34	35	48,925
Secondary/vocational	14.6	6	7.7	14,666	18.9	9.7	11.9	2,143	26	14.4	19.3	846	17.2	6.8	8.8	12,237
Post-secondary diploma	1.6	0.4	0.7	1,259	2.1	0.5	0.9	163	2.8	1.1	1.8	79	1.9	0.5	0.8	1,060
Tertiary	13.2	3.7	5.6	10,619	19.4	5.9	9.2	1,645	27	12	18.3	804	19	4.4	7.1	9,995
Female	8,190	22,557	30,747	30,747	765	2,664	3,429	3,429	212	224	436	436	10,885	23,087	33,972	33,972
Never attended	46.7	60.5	56.8	17,465	49.5	78.7	72.2	2,476	22.2	47.8	35.3	154	33.4	56.1	48.8	16,577
Basic education	41.9	35.7	37.3	11,481	34.5	18.1	21.7	745	42	41.5	41.7	182	50.4	39.2	42.8	14,527
Secondary/vocational	6.3	2.4	3.4	1,051	6.7	2.1	3.1	106	14.6	6.3	10.3	45	9.2	2.9	4.9	1,657
Post-secondary diploma	0.7	0.3	0.4	125	1.4	0.2	0.4	15	2.4	0.4	1.4	6	1	0.3	0.5	179
Tertiary	4.4	1.2	2	625	7.8	1	2.5	87	18.9	4	11.2	49	6	1.6	3	1,032

Literacy status of livestock holders

At least three quarters of livestock holders in urban areas who are rearing non-ruminants (75.1%) and more than four-fifth of those rearing non-traditional livestock (88.1%) can read and write with understanding in at least one language. Similarly, about two-thirds (67.6%) of holders in the urban areas who rear poultry as well as holders in the rural areas who rear non-traditional livestock (66.8%) are literate in at least one language. A similar pattern is observed for males, while for females, only the proportion engaged in non-traditional livestock is more than two-thirds and those in urban areas rearing non-traditional livestock (51.2%) and poultry (53.7%), have about half of the proportion being literate.

Livestock holders in the urban areas who rear non-traditional livestock (63.8%) constitute the highest proportion of holders who are literate in English with a Ghanaian language. This is followed by holders in the urban areas who rear non-ruminants (48.9%) and poultry (42.3%) as well as holders in rural area rearing non-ruminants (43.6%).

The proportion of males who are literate is higher than that of females for all types of livestock and in both urban and rural areas. Similarly, higher proportions of males than females are literate in English with a Ghanaian language and in English only for each type of livestock in both urban and rural areas. On the contrary, higher proportions of females than males are literate in Ghanaian language only for all types of livestock (Table 10.5).

Table 10.5: Livestock holders 15 years or older by sex, literacy status and language, and by categories of livestock and type of locality

Literacy and sex	Ruminants		Non-ruminants		Non-traditional livestock		Poultry	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both Sexes								
Total	46,469	173,878	5,149	16,244	2,065	2,763	36,867	137,030
None (not literate)	39.2	62.4	24.9	55.4	11.9	33.1	32.4	59.2
Literate	60.8	37.6	75.1	44.6	88.1	66.9	67.6	40.8
Literate	28257	65310	3869	7241	1820	1848	24915	55883
English only	14.4	7.7	14.9	9.1	15.1	11.1	13.2	8.3
Ghanaian lang. only	10.5	12.4	10.8	12.8	7.6	11.2	11.3	11.8
English & Ghanaian lang.	34.6	16.5	48.9	21.9	63.8	43.6	42.3	19.7
Engl. & French	0.1	0.0	0.2	0.1	0.1	0.3	0.1	0.0
Engl. Fren. & Gh'ian lang.	0.2	0.1	0.3	0.2	1.1	0.3	0.3	0.1
Other	0.9	0.8	0.1	0.6	0.5	0.4	0.4	0.8
Male								
Total	38,275	151,320	4,384	13,580	1,853	2,539	25,978	113,932
None (not literate)	36.0	61.7	20.7	51.5	10.0	31.2	26.6	57.6
Literate	64.0	38.3	79.3	48.5	90.0	68.8	73.4	42.4
Literate	24496	57956	3477	6586	1668	1747	19068	48307
English only	15.7	8.2	15.8	10.1	15.6	11.3	14.9	9.0
Ghanaian lang. only	9.6	12.0	9.6	12.8	6.9	11.1	9.3	11.5
English & Ghanaian lang.	37.2	17.2	53.3	24.7	65.8	45.4	48.3	20.9
Engl. & French	0.1	0.0	0.2	0.1	0.1	0.3	0.1	0.0
Engl. Fren. & Gh'ian lang.	0.3	0.1	0.3	0.2	1.2	0.3	0.3	0.1
Other	1.0	0.8	0.1	0.6	0.4	0.4	0.5	0.8
Female								
Total	8,194	22,558	765	2,664	212	224	10,889	23,098
None (not literate)	54.1	67.4	48.8	75.4	28.3	54.9	46.3	67.2
Literate	45.9	32.6	51.2	24.6	71.7	45.1	53.7	32.8
Literate	3761	7354	392	655	152	101	5847	7576
English only	8.1	4.0	9.7	3.6	10.8	8.9	9.2	5.0
Ghanaian lang. only	14.8	15.2	17.8	12.7	13.7	12.1	16.0	13.6
English & Ghanaian lang.	22.5	12.4	23.4	7.4	45.8	23.7	28.1	13.4
Engl. & French	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Engl. Fren. & Gh'ian lang.	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Other	0.4	1.0	0.3	0.8	1.4	0.4	0.3	0.7

10.2.4 Nationality of livestock holders

Almost all holders (99.5%) who are rearing livestock are Ghanaians. The proportion of non-Ghanaians is higher than the average among holders rearing ruminants in the urban (0.7%) and rural (0.6%) areas as well as holders in the urban areas rearing non-traditional livestock (0.7%).

The proportion of Burkina Faso nationals who are holders rearing livestock are the highest among the non-Ghanaians especially among holders in urban and rural areas rearing ruminants (34.9% and 51.7% respectively) and among holders in both urban and rural areas rearing poultry (28.3% and 38.6% respectively), see Table 10.6.

Table 10.6: Livestock holders 15 years or older by nationality, and by categories of livestock and type of locality

Nationality	Ruminants		Non-ruminants		Non-traditional livestock		Poultry		Total		Total
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Total	46,469	173,878	5,149	16,244	2,065	2,763	36,867	137,030	75,882	248,816	324,698
Ghanaian	99.3	99.4	99.8	99.8	99.3	99.8	99.7	99.7	99.5	99.5	99.5
Non-Ghanaian	0.7	0.6	0.2	0.2	0.7	0.2	0.3	0.3	0.5	0.5	0.5
Non-Ghanaian	312	1,123	10	25	15	6	120	435	383	1,198	1,581
<i>Burkina Faso</i>	34.9	51.7	10.0	12.0	0.0	0.0	28.3	38.6	31.6	47.3	43.5
<i>Cote d'Ivoire</i>	2.6	2.0	10.0	4.0	0.0	33.3	8.3	5.1	4.2	3.0	3.3
<i>Nigeria</i>	7.1	6.3	10.0	0.0	46.7	0.0	14.2	4.6	10.2	5.8	6.8
<i>Togo</i>	10.9	12.2	60.0	64.0	26.7	66.7	22.5	29.4	15.7	17.9	17.4
<i>Other African</i>	43.6	27.6	10.0	20.0	6.7	0.0	23.3	21.4	36.3	25.7	28.3
<i>Non-Africans</i>	1.0	0.1	0.0	0.0	20.0	0.0	3.3	0.9	2.1	0.3	0.8

10.2.5 Disability status of livestock holders

About 9 percent of holders who are rearing livestock have some form of disability with proportions ranging from 6.8 percent among holders in the urban areas rearing poultry to 9.5 percent among holders in the rural areas rearing non-traditional livestock. A similar pattern is observed for males and females with the proportion of female holders who have some form of disability, higher than males for all types of livestock (Table 10.7).

Table 10.7: Livestock holders 15 years or older by sex and disability status, and by categories of livestock and type of locality

Disability status	Ruminants		Non-ruminants		Poultry		Non-traditional livestock		Total		Total
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Both sexes											
Total	46,469	173,878	5,149	16,244	2,065	2,763	36,867	137,030	75,882	248,816	324,698
Without disability	91.7	91.3	92.3	92.2	93.2	92.1	91.1	90.5	91.6	91.0	91.1
With disability	8.3	8.7	7.7	7.8	6.8	7.9	8.9	9.5	8.4	9.0	8.9
Male											
Total	38,275	151,320	4,384	13,580	1,853	2,539	25,978	113,932	58,052	207,744	265,796
Without disability	93.1	92.2	93.0	93.3	93.6	92.3	93.2	91.6	93.1	92.0	92.3
With disability	6.9	7.8	7.0	6.7	6.4	7.7	6.8	8.4	6.9	8.0	7.7
Female											
Total	8,194	22,558	765	2,664	212	224	10,889	23,098	17,830	41,072	58,902
Without disability	85.4	84.8	87.7	86.9	89.2	90.2	86.3	85.0	86.0	85.1	85.3
With disability	14.6	15.2	12.3	13.1	10.8	9.8	13.7	15.0	14.0	14.9	14.7

Types of disability of livestock holders

The common form of disability among livestock holders is sight followed by physical disabilities. This observation cuts across urban and rural areas, and male and female holders. The proportions of holders in urban areas who are rearing non-ruminants (48.3%), non-traditional livestock (47.2%) and poultry (46.3%) have sight challenges. The proportion of the physically challenged is higher in rural areas than in urban areas with higher proportion among holders rearing poultry (42.3%), non-ruminants (40.0%) and non-traditional livestock (40.0%) in rural areas. A similar pattern is observed for males and females with a higher proportion of females suffering from physical disability than their male counterparts (Table 10.8).

Table 10.8: Livestock holders 15 years or older by sex and type of disability, and by categories of livestock and type of locality

Type of disability	Ruminants		Non-ruminants		Poultry		Non-traditional livestock		Total	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both sexes										
Total responses*	5,073	20,722	516	1,673	175	281	4,244	17,492	10,008	40,168
Sight	43.7	41.5	48.3	41.1	46.3	40.6	47.2	41.8	45.5	41.6
Hearing	11.4	14.0	12.6	13.7	8.0	12.1	10.2	13.0	10.9	13.5
Speech	6.1	5.4	7.4	5.2	8.6	5.0	5.2	5.2	5.8	5.3
Physical	38.8	39.2	31.8	40.0	37.1	42.3	37.4	40.0	37.8	39.6
Male										
Total responses	3,432	15,981	380	1,172	150	253	2,262	12,780	6,224	30,186
Sight	44.5	40.8	49.7	41.2	45.3	42.3	45.4	41.0	45.1	40.9
Hearing	11.1	14.2	11.8	13.7	8.7	11.9	10.7	13.4	10.9	13.8
Speech	6.7	6.0	7.1	5.5	9.3	5.1	6.6	5.7	6.7	5.8
Physical	37.8	39.0	31.3	39.6	36.7	40.7	37.3	39.9	37.2	39.4
Female										
Total responses	1,641	4,741	136	501	25	28	1,982	4,712	3,784	9,982
Sight	42.0	43.8	44.1	40.5	52.0	25.0	49.4	44.1	46.0	43.7
Hearing	12.1	13.1	14.7	14.0	4.0	14.3	9.6	11.9	10.8	12.6
Speech	4.9	3.4	8.1	4.4	4.0	3.6	3.5	3.7	4.3	3.6
Physical	41.0	39.7	33.1	41.1	40.0	57.1	37.5	40.3	38.9	40.1

*A person could have more than one form of disability.

10.3 Livestock husbandry practices

About three-quarters (74.4%) of livestock holders house their livestock. Proportionately, more holders house their livestock in urban areas (83.0%) than in rural areas (72.0%). There is little difference between male and female holders (Table 10.9).

Table 10.9: Livestock holders 15 years or older by sex and type of housing practiced, and by type of locality

Livestock Housed	Urban		Rural		Total	
	Number	Percent	Number	Percent	Number	Percent
All holders	75,882	100.0	248,816	100.0	324,698	100.0
Yes,	63,026	83.1	179,082	72.0	241,448	74.4
No, free range	12,856	16.9	69,734	28.0	83,250	25.6
Male holders	58,052	100.0	207,744	100.0	265,796	100.0
Yes,	48,196	83.0	149,418	71.9	197,081	74.1
No, free range	9,856	17.0	58,326	28.1	68,715	25.9
Female holders	17,830	100.0	41,072	100.0	58,902	100.0
Yes,	14,831	83.2	29,679	72.3	44,444	75.5
No, free range	2,999	16.8	11,393	27.7	14,458	24.5

The proportion of holders housing the various types of livestock ranges from 63.3 percent of holders rearing non-traditional livestock in rural areas to 83.6 percent of holders rearing poultry in urban areas, except in the case of non-ruminants for which 90 percent of holders in urban areas provide shelter (Table 10.10). For rural areas, a relatively higher proportion of non-ruminants are not housed (free-range) compared to the other types of livestock.

**Table 10.10: Livestock holders 15 years or older by sex and type of housing practiced,
and by categories of livestock and type of locality**

Livestock Housed	Ruminants			Non-ruminants			Non-traditional livestock			Poultry						
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	All	Urban	Rural	All				
<i>All holders</i>	46,444	173,829	220,273	220,273	5,148	16,239	21,387	21,387	2,065	2,759	4,824	4,824	36,845	136,921	173,766	173,766
Housed	81.8	71.0	73.3	161,424	90.3	74.7	78.4	16,776	82.8	63.3	71.6	3,456	83.6	73	75.3	130,822
Not housed (free range)	18.2	29	26.7	58,849	9.7	25.3	21.6	4,611	17.2	36.7	28.4	1,368	16.4	27	24.7	42,944
<i>Male holders</i>	38,254	151,272	189,526	189,526	4,383	13,575	17,958	17,958	1,853	2,535	4,388	4,388	25,960	113,834	139,794	139,794
Housed	81.6	70.6	72.8	138,017	91	76.1	79.7	14,321	82.7	62.8	71.2	3,124	83.8	73.4	75.3	105,269
Not housed (free range)	18.4	29.4	27.2	51,509	9.0	23.9	20.3	3,637	17.3	37.2	28.8	1,264	16.2	26.6	24.7	34,525
<i>Female holders</i>	8,190	22,557	30,747	30,747	765	2,664	3,429	3,429	212	224	436	436	10,885	23,087	33,972	33,972
Housed	82.7	73.7	76.1	23,407	86.3	67.4	71.6	2,455	83.5	69.2	76.1	332	83.3	71.4	75.2	25,553
Not housed (free range)	17.3	26.3	23.9	7,340	13.7	32.6	28.4	974	16.5	30.8	23.9	104	16.7	28.6	24.8	8,419

10.4 Purpose of livestock production

Majority (52.5%) of holders who rear livestock, produce mostly for purposes of sale with minor consumption or for sales only (15.5%). The sum of the proportions of livestock produce meant for sales and sales with minor consumption for holders rearing non-ruminants (88.0%), ruminants (77.4%) and non-traditional livestock (76.0%) are higher than the average of 52.5 percent.

Poultry includes barn-yard which refers to a fenced area used for rearing domestic birds.

Non-traditional livestock include; rabbits, grasscutters, snails etc.

More female than male holders produce livestock for purposes of consumption only or for purposes of consumption with minor sales. Conversely, more male than female holders produce for purposes of sales only or sales with minor consumption. About 17 percent of males produce for consumption only compared to 53.4 percent of their female counterparts who produce for the same purpose. Conversely, about 50 percent of males produce for sales with minor consumption compared to 15.4 percent of their female counterparts for the same purpose (Table 10.11).

Table 10.11: Livestock holders 15 years or older by type of locality and purpose of production, and categories of livestock and sex

Purpose	Ruminants			Non-ruminants			Non-traditional livestock			Poultry and barn-yard			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
All types of localities															
Consumption only	6.1	8.8	6.4	3.4	3.7	3.5	10.2	14.4	10.6	16.8	27.3	18.8	10.2	17.7	11.5
Consumption with minor sales	16.0	17.4	16.2	8.8	7.4	8.6	13.2	15.6	13.4	27.5	28.1	27.6	20.2	22.2	20.5
Sales only	21.1	19.4	20.9	31.9	39.3	33.1	21.5	22.2	21.6	6.5	5.9	6.4	15.9	13.7	15.5
Sales with minor consumption	56.9	54.4	56.5	55.9	49.6	54.9	55.1	47.7	54.4	49.2	38.7	47.2	53.7	46.3	52.5
Urban	38,254	8,190	46,444	4,383	765	5,148	1,853	212	2,065	25,960	10,885	36,845	70,450	20,052	90,502
Consumption only	9.2	13.4	10.0	1.8	2.0	1.8	11.3	18.9	12.1	24.9	35.6	28.1	14.6	25.1	16.9
Consumption with minor sales	14.6	17.2	15.0	5.6	7.5	5.9	11.4	15.1	11.8	23.8	21.5	23.1	17.3	19.2	17.7
Sales only	20.5	17.0	19.9	38.1	42.1	38.7	21.2	22.2	21.3	7.5	6.9	7.3	16.8	12.5	15.9
Sales with minor consumption	55.7	52.4	55.1	54.5	48.5	53.6	56.1	43.9	54.9	43.8	36.0	41.5	51.3	43.2	49.5
Rural	151,272	22,557	173,829	13,575	2,664	16,239	2,535	224	2,759	113,835	23,086	136,921	281,217	48,531	329,748
Consumption only	57.1	55.2	56.9	56.3	49.9	55.3	54.4	51.3	54.1	50.5	40.0	48.7	54.4	47.6	53.4
Consumption with minor sales	5.3	7.1	5.5	4.0	4.2	4.0	9.4	10.3	9.5	14.9	23.3	16.3	9.1	14.7	10.0
Sales only	16.3	17.5	16.5	9.8	7.4	9.4	14.6	16.1	14.7	28.4	31.2	28.9	20.9	23.5	21.2
Sales with minor consumption	21.3	20.2	21.2	29.9	38.6	31.3	21.7	22.3	21.7	6.2	5.5	6.1	15.6	14.2	15.4

10.5 Livestock population

The total livestock population is 17,709,547, with poultry forming the highest proportion (73.9%) followed by ruminants (21.2%). Non-traditional livestock constitute 2 percent. The proportion of poultry (81.9%) kept by holders in urban areas is higher than those in rural areas (68.4%). Conversely, holders in rural areas have twice the proportion of ruminants (26.8%) as in urban areas (13.1 %), see Table 10.12.

Table 10.12: Livestock population by categories of livestock, and by type of locality

Type of livestock	Urban		Rural		Total	
	Number	Percent	Number	Percent	Number	Percent
Total	7,201,067	100.0	10,508,480	100.0	17,709,547	100.0
Ruminants	942,827	13.1	2,815,820	26.8	3,758,647	21.2
Non-ruminants	197,505	2.7	315,907	3.0	513,412	2.9
Non-traditional	160,665	2.2	189,997	1.8	350,662	2.0
Poultry	5,900,070	81.9	7,186,756	68.4	13,086,826	73.9

Goats are the most reared ruminants (49.8%), and for non-ruminants, pigs (both local and exotic) are the most reared (98.8%). The most reared non-traditional livestock are snails (51.7%). For poultry, chicken of all types (local, exotic and cross breed) are the most reared (91.5%), with the exotic chicken (50.7%) being the most dominant (Table 10.13).

Table 10.13: Livestock population by categories of livestock and type of livestock

Species	Number	%
All Species	17,709,547	
<i>Ruminants</i>		
Total	3,758,647	100.0
Cattle	769,804	20.5
Goats	1,872,729	49.8
Sheep	1,116,114	29.7
<i>Non-ruminants</i>		
All	513,412	100.0
Local pigs	303,056	59.0
Exotic pigs	204,203	39.8
Horses	334	0.1
Donkeys	5,624	1.1
Mules	195	0.0
<i>Non-traditional livestock</i>		
Total	350,662	100.0
Snails	181,247	51.7
Grasscutters	20,338	5.8
Rabbits	120,032	34.2
Others	29,045	8.3
<i>Poultry</i>		
Total	13,086,826	100.0
Local chicken	4,822,840	36.9
Cross breed chicken	511,849	3.9
Exotic chicken	6,633,021	50.7
Guinea fowl	734,601	5.6
Duck	169,420	1.3
Goose	2,074	0.0
Ostrich	295	0.0
Turkey	48,654	0.4
Pigeon	16,259	0.1
Quail	44,954	0.3

<u>Other poultry</u>	<u>102,859</u>	<u>0.8</u>
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For the 2017/18 cropping season, 4,609,177 poultry, 1,556,160 ruminants and 299,345 non-ruminants were produced whereas 1,306,121 poultry, 97,266 ruminants and 13,310 non-ruminants were purchased. For both quantities produced or purchased, the number of females exceeded that of males for all types of livestock and poultry (Table 10.14).

Table 10.14: Quantity (number) by the phases of livestock production in the reference period, and by categories of livestock and sex of livestock

Quantity of livestock*	Ruminants			Non-ruminants			Poultry		
	Male	Female	Number	Male	Female	Number	Male	Female	Number
Total	1,386,941	2,371,706	3,758,647	204,338	309,074	513,412	4,030,742	9,056,084	13,086,826
%	36.9	63.1	3,758,647	39.8	60.2	513,412	30.8	69.2	13,086,826
Quantity at the beginning of 2017	33.6	66.4	2,105,221	36.7	63.3	200,757	25.2	74.8	7,171,528
Quantity produced in the reference period	41.3	58.7	1,556,160	41.9	58.1	299,345	39.1	60.9	4,609,177
Quantity bought in the reference period	37.4	62.6	97,266	39.3	60.7	13,310	32.1	67.9	1,306,121

*Beginning and end stock for non-traditional livestock were not collected.

10.6 Livestock off-take

A total of 7,964,349 livestock was either sold, consumed, given out as gifts, stolen, lost or died (off-take) in the reference period with similar proportions in both rural and urban areas. The proportion of off-take of ruminants was the lowest (35.5%) and that of poultry was the highest (47.7%). Non-traditional off-take is highest (52.9%) in urban areas while poultry off-take is the highest (48.2%) in rural areas. (Table 10.15).

Table 10.15: Quantity (number) by categories of livestock, and by type of locality and quantity of livestock off-take

Livestock Type	Urban			Rural			Total		
	Quantity		Percent	Quantity		Percent	Quantity		Percent
	of	Off-take ⁺		of	Off-take ⁺		of	Off-take ⁺	
	livestock*	Number		livestock*	Number		livestock*	Number	
Total	7,201,067	3,287,034	45.6	10,508,480	4,677,315	44.5	17,709,547	7,964,349	45.0
Ruminants	942,827	341,732	36.2	2,815,820	994,140	35.3	3,758,647	1,335,872	35.5
Non-ruminants	197,505	88,853	45.0	315,907	140,538	44.5	513,412	229,391	44.7
Non-traditional	160,665	85,000	52.9	189,997	77,321	40.7	350,662	162,321	46.3
Poultry	5,900,070	2,771,449	47.0	7,186,756	3,465,316	48.2	13,086,826	6,236,765	47.7

+Refers to number of livestock that were sold, consumed, died, were stolen or given out as gift during the reference period;

*Number of livestock available during the reference period and includes initial stock owned by holders, births and purchases during the reference period.

More than one-quarter (27.0%) of the total off-take was lost through death with higher proportions among ruminants (34.0%) and non-ruminants (29.2%). Only about one-third of ruminants were sold compared to 56.9 percent of non-ruminants and 52.6 percent of poultry. The proportion of livestock consumed was relatively higher (24.0%) among non-traditional livestock and relatively lower (7.6%) among non-ruminants. A similar pattern is observed for urban and rural areas (Table 10.16).

Table 10.16: Quantity (number) by type of locality and type of livestock off-take, and by categories of livestock

Type of Off-Take	Ruminants		Non-ruminants		Non-traditional livestock		Poultry		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total	1,335,872	100.0	229,391	100.0	162,321	100.0	6,236,765	100.0	7,964,349	100.0
Consumed	183,653	13.7	17,401	7.6	38,885	24.0	826,963	13.3	1,066,902	13.4
Sold	498,573	37.3	130,476	56.9	77,661	47.8	3,282,401	52.6	3,989,110	50.1
Died	453,990	34.0	66,993	29.2	23,796	14.7	1,612,307	25.9	2,157,086	27.1
Stolen	117,423	8.8	6,672	2.9	5,238	3.2	221,791	3.6	351,124	4.4
Given out	82,234	6.2	7,849	3.4	16,741	10.3	293,303	4.7	400,126	5.0
All Urban	341,732	100.0	88,853	100.0	85,000	100.0	2,771,449	100.0	3,287,034	100.0
Consumed	55,266	16.2	5,136	5.8	17,746	20.9	218,907	7.9	297,054	9.0
Sold	131,174	38.4	57,775	65.0	44,712	52.6	1,853,433	66.9	2,087,094	63.5
Died	91,647	26.8	20,712	23.3	11,543	13.6	535,404	19.3	659,305	20.1
Stolen	42,357	12.4	2,528	2.8	2,907	3.4	78,665	2.8	126,457	3.8
Given out	21,288	6.2	2,702	3.0	8,092	9.5	85,040	3.1	117,122	3.6
All Rural	994,140	100.0	140,538	100.0	77,321	100.0	3,465,316	100.0	4,677,315	100.0
Consumed	128,387	12.9	12,265	8.7	21,140	27.3	608,056	17.5	769,848	16.5
Sold	367,398	37.0	72,701	51.7	32,949	42.6	1,428,968	41.2	1,902,016	40.7
Died	362,343	36.4	46,281	32.9	12,253	15.8	1,076,903	31.1	1,497,780	32.0
Stolen	75,066	7.6	4,144	2.9	2,331	3.0	143,126	4.1	224,667	4.8
Given out	60,946	6.1	5,147	3.7	8,648	11.2	208,263	6.0	283,004	6.1

10.7 Production and sale

About 6.8 million livestock were produced during the 2017/18 cropping season of which poultry (4,609,177) contributed the largest proportion (67.5%). Slightly more than five times as many ruminants as non-ruminants were produced within the period. Quantity of livestock sold in the reference period was 4,006,717, representing 58.6 percent of the total quantity produced. About 58.6 percent of livestock produced was sold. A higher proportion of poultry produced was sold (71.2%) than any livestock. The number of livestock sold by holders in the urban areas is more than one-fifth (23.8%) of the number produced. (Table 10.17).

Table 10.17: Quantity (number) by categories of livestock, and by quantity produced, quantity sold, cost of production (GHC) and type of locality

Type of livestock	Quantity produced			Quantity sold			Ratio of sold to production			Cost of production		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
Total	2,144,102	4,687,726	6,831,828	2,094,422	1,912,295	4,006,717	97.7	40.8	58.6	101,681,322	96,578,036	198,259,358
Ruminants	25.4	74.6	1,556,160	26.3	73.7	498,557	33.2	31.7	32.0	39.7	60.3	68,698,151
Non-ruminants	37.6	62.4	299,345	44.3	55.7	130,476	51.4	38.9	43.6	52.3	47.7	26,143,202
Non-traditional livestock	44.9	55.1	220,566	54.6	45.4	95,283	52.6	35.6	43.2	68.4	31.6	2,228,362
Poultry	32.5	67.5	4,609,177	56.5	43.5	3,282,401	123.8	45.9	71.2	58.5	41.5	101,189,643

10.8 Livestock produce

Of the 96,329 livestock holders who produce meat, 45,265 rear ruminants and 44,908 rear poultry, representing a total of 93.6 percent. There were 6,735 holders producing milk and 63,113 producing egg (Table 10.18).

Livestock produce refers to the product derived from the rearing of livestock and poultry such as meat, milk, eggs, hide/leather, dung and honey.

Table 10.18: Livestock holders 15 years or older by type of livestock produce, and by categories of livestock and by type of locality

Produce from livestock	<u>Ruminants</u>			<u>Non-ruminants</u>			<u>Non-traditional livestock</u>			<u>Poultry</u>			<u>Total</u>		
	<u>Urban</u>	<u>Rural</u>	<u>N</u>	<u>Urban</u>	<u>Rural</u>	<u>N</u>	<u>Urban</u>	<u>Rural</u>	<u>N</u>	<u>Urban</u>	<u>Rural</u>	<u>No</u>	<u>Urban</u>	<u>Rural</u>	<u>N</u>
Meat	23.3	76.7	45,265	25.6	74.4	5,331	44.6	55.4	825	18.4	81.6	44,908	21.3	78.7	96,329
Milk	19.9	80.1	6,736	-	-	-	-	-	-	-	-	-	19.9	80.1	6,736
Egg	-	-	-	-	-	-	-	-	-	22.0	78.0	63,113	22.0	78.0	63,113
Breeding stock	19.7	80.3	10,404	24.2	75.8	1,424	47.6	52.4	187	16.1	83.9	9,495	18.6	81.4	21,510
Hide/leather	22.2	77.8	270	33.3	66.7	6	-	-	-	-	-	-	22.5	77.5	276
Animal traction	8.0	92.0	1,932	1.7	98.3	116	-	-	-	-	-	-	7.6	92.4	2,048
Dung	12.4	87.6	27,225	12.8	87.2	2,109	47.1	52.9	85	14.4	85.6	8,338	12.9	87.1	37,757
Honey	-	-	-	-	-	-	26.7	73.3	161	-	-	-	26.7	73.3	161
Other	9.1	90.9	394	14.0	86.0	50	31.3	68.8	16	17.2	82.8	239	12.7	87.3	699

A total of 210,598.5 mts of meat was produced by livestock holders in the reference period with about the same proportions for both holders in urban (50.1%) and rural (49.9%) areas. Milk is almost exclusively (99.8%) produced in rural areas. About two-thirds (66.4%) of the total production of eggs (29,550,479 crates) was from holders in urban areas.

About 97 percent of meat from ruminants was produced by rural holders. In contrast, 73.4 percent of meat from non-ruminant was produced by holders in urban areas. Among holders in poultry production, 98.6 percent of meat and 66.4 percent of eggs were produced by holders in the urban areas (Table 10.19).

Table 10.19: Quantity by type of livestock produce, and by categories of livestock and type of locality

Produce from livestock	Ruminants			Non-ruminants			Non-traditional livestock			Poultry			Total		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
Total															
Meat (KG)	3.3	96.7	106,584,176	73.4	26.6	2,123,798	61.2	38.8	23,619	98.6	1.4	101,866,906	50.1	49.9	210,598,499
Milk (Litres)	0.2	99.8	403,730,608	-	-	-	-	-	-	-	-	-	0.2	99.8	403,730,608
Egg (Crates)	-	-	-	-	-	-	-	-	-	66.4	33.6	29,550,479	66.4	33.6	29,550,479
Breeding Stock (Number)	16.6	83.4	98,037	38.9	61.1	17,569	9.9	90.1	18,994	23.7	76.3	202,678	21.7	78.3	337,278
Hide/leather (KG)	41.5	58.5	5,506	70.2	29.8	57	-	-	-	-	-	-	41.8	58.2	5,563
Animal traction (KG)	4.9	95.1	791,716	0.1	99.9	12,573	-	-	-	-	-	-	4.8	95.2	804,289
Dung (KG)	12.0	88.0	14,752,493	47.2	52.8	1,450,533	77.0	23.0	7,845	9.6	90.4	1,276,705	14.8	85.2	17,487,576
Honey (Gallons)	-	-	-	-	-	-	56.9	43.1	45,416	-	-	-	56.9	43.1	45,416
Other specify	6.9	93.1	108,822	18.4	81.6	15,117	3.7	96.3	1,699	1.2	98.8	118,258	4.8	95.2	243,896

- Not applicable

CHAPTER ELEVEN

FORESTRY

11.1 Introduction

This chapter presents analysis on the characteristics of holders who grow forest trees, the number and type of forest trees grown, classification of forest trees, production and sales of forest trees, purpose for growing and the tenure arrangement on parcels used for growing forest trees.

Classification of forest trees

The Forestry Commission of Ghana classifies forest tree species by two dimensions: “Market Orientation” and “Policy Orientation”.

Market-oriented categories are:

Export Only: Species with high export demand and are mostly exported.

Domestic Only: Species with very low export demand and are mostly sold on the domestic market.

Export and Domestic; Species that are exported and also commonly found in the domestic market. **Others:** Other species of potential value yet unknown on the market.

The Policy-oriented categories are:

Protected species: Species that are endangered (near-extinction) and therefore regulated by law during its harvest.

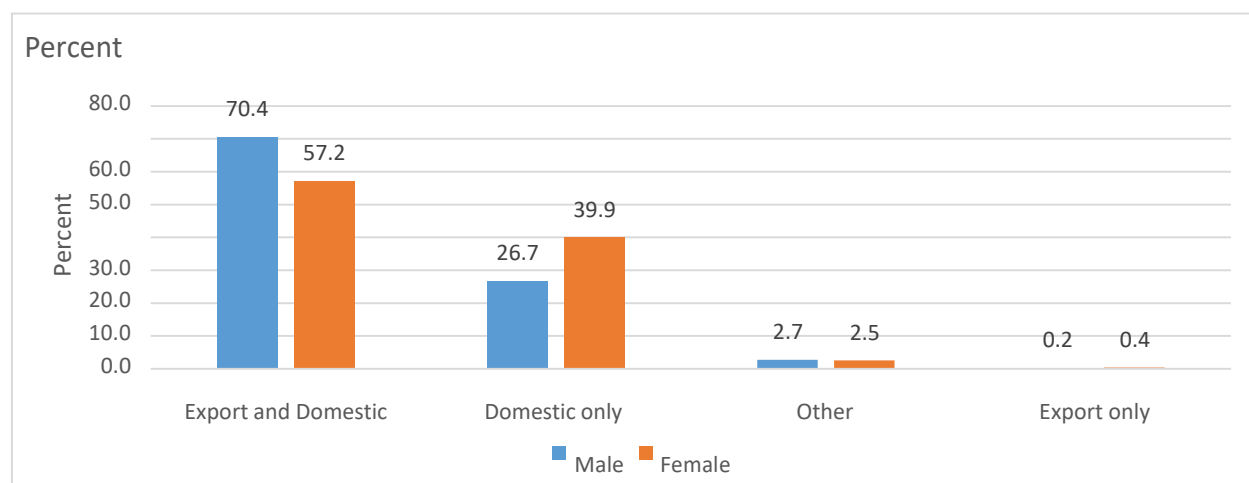
Promoted species: Species that are on very low demand and are being marketed by the Forestry Commission.

11.2 Classification of forest trees

11.2.1 Market-oriented classification

Seven in ten (70.4%) male holders of forest trees, produce species which are classified as “Export and Domestic” while the corresponding proportion for females is 57.2 percent. More female (39.9%) than male (26.7%) holders produce species classified as “Domestic Only” . Only 0.2 percent of male holders and 0.4 percent of female holders cultivated forest tree species classified as “Export Only” (Figure 11.1).

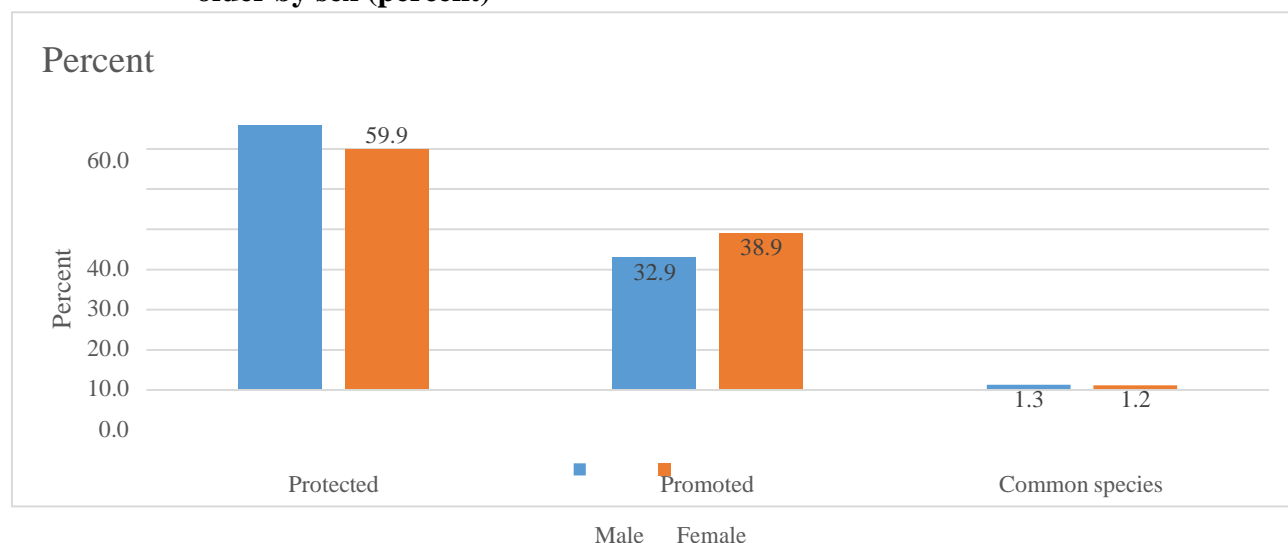
Figure 11.1: Type of market-oriented forest tree classification of holders 15 years or older by sex (percent)



11.2.2 Policy-oriented classification

More male (65.8%) than female (59.9%) holders cultivate species that are classified as “Protected” while more female (38.9%) than male (32.9%) holders cultivate species that are classified as “Promoted” (Figure 11.2).

Figure 11.2: Type of policy-oriented forest tree classification of holders 15 years or older by sex (percent)



11.2.3 Forest tree holders and types of forest tree classification engaged

Cultivation of forest tree is mostly a male dominated activity. A total of 11,660 forest tree holders, have 9,831, representing 84.3 percent, as males. Similarly, most forest tree holders (9,980), representing 85.6 percent, are in rural areas. Almost all forest tree holders in both urban and rural areas are cultivating three main species, ofram (42.7%), acacia (29.9%), and teak (22.8%). The proportion of holders who are not cultivating these three species is about 5 percent. More than two-thirds (76.9%) are cultivating forest trees classified as “Export and

Domestic” while about one-third (32.3%) are cultivating forest trees classified as “Domestic only” (Table 11.1).

Table 11.1: Forest tree holders 15 years or older by type of forest tree classification and type of species and by type of locality and sex*

Tree Classification /Species	Urban			Rural			Total %			Total number		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Overall Total	1,395	285	1,680	8,436	1,544	9,980	9,831	1,829	11,660	9,831	1,829	11,660
Total	83.6	71.2	81.5	79.1	60.4	76.2	79.7	62.1	76.9	7,836	1,136	8,972
Wawa	4.1	2.1	3.8	4.6	3.6	4.5	4.5	3.3	4.4	447	61	508
Watapuo	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7	2	9
Teak	55.4	48.8	54.3	18.5	12.0	17.5	23.7	17.7	22.8	2,330	324	2,654
Ofram	16.8	15.4	16.5	48.5	39.4	47.1	44.0	35.7	42.7	4,322	653	4,975
Mansonia	0.0	0.4	0.1	0.2	0.3	0.2	0.1	0.3	0.2	13	5	18
Kuisa	1.6	1.4	1.6	0.2	0.3	0.3	0.4	0.5	0.5	44	9	53
Emeri	1.7	1.4	1.7	3.8	2.9	3.7	3.5	2.7	3.4	344	49	393
Bombax	0.2	0.0	0.2	0.1	0.0	0.1	0.1	0.0	0.1	9	0	9
Awimfosamit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0	1
Mahogany	1.1	1.1	1.1	1.7	0.9	1.6	1.6	0.9	1.5	160	17	177
White wood	0.2	0.4	0.2	0.1	0.0	0.1	0.1	0.1	0.1	8	1	9
Cedrell	1.9	0.4	1.7	0.4	0.1	0.4	0.6	0.2	0.5	61	3	64
Odum	0.4	0.0	0.3	0.8	0.6	0.8	0.8	0.5	0.7	75	10	85
Ceiba	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	10	1	11
Apro	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1	1	2
Edinam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0	2
Kyenkyen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	0	2
Total	0.4	1.4	0.5	0.2	0.3	0.2	0.2	0.4	0.3	22	8	30
Potrodom	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4	0	4
Kokrodua	0.1	0.7	0.2	0.0	0.0	0.0	0.0	0.1	0.0	2	2	4
Iroko	0.1	0.7	0.2	0.1	0.1	0.1	0.1	0.2	0.1	7	3	10
Akore	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0	2	2
Sapele	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9	1	10
Total	17.6	29.5	19.6	32.3	45.9	34.4	30.2	43.4	32.3	2,968	793	3,761
Acacia	16.4	26.7	18.2	29.6	44.5	31.9	27.7	41.7	29.9	2,722	763	3,485
Kapok	0.0	0.4	0.1	0.1	0.0	0.1	0.1	0.1	0.1	8	1	9
Neem tree	1.1	2.1	1.3	2.6	1.4	2.4	2.4	1.5	2.2	232	28	260
Eucalyptus	0.0	0.4	0.1	0.1	0.0	0.1	0.1	0.1	0.1	6	1	7
Other	6.6	4.9	6.3	2.5	2.3	2.4	3.1	2.7	3.0	300	49	349

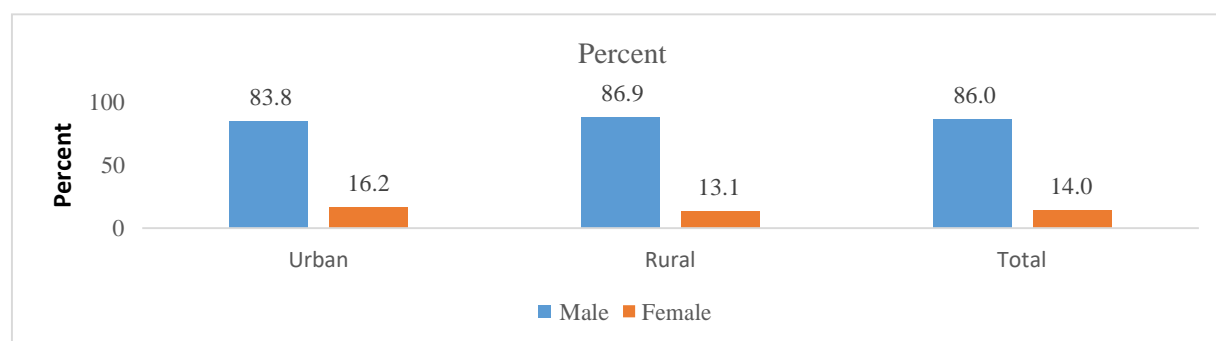
*Holders are counted as many times as they are engaged in different forest tree production. This explains why the number of holders is more than the actual count of holders.

11.3 Socio-demographic characteristics of holders of forest trees

11.3.1 Type of localities of holders of forest trees

An overwhelming majority of forest trees holders are males (average of 85.4%), in both urban and rural areas, see Figure 11.3

Figure 11.3: Type of locality of forest tree holders 15 years or older by sex (percent)



11.3.2 Age and sex of holders and type of forest trees classification

Market-oriented classification

More than three quarters (76.9%) of holders cultivate forest tree species classified as “Export and Domestic” and 32.3 percent cultivate species classified as “Domestic only”. With the exception of holders in the age group of 60+ years, the proportion of holders that cultivate forest tree species classified as “Export and Domestic” in each age group is at least two-thirds. Only 0.2 percent of holders in each age group cultivate forest tree species classified as “Export only”. More male (79.7%) than female (62.1%) holders cultivate forest tree species classified as “Export and Domestic”. For the “Other” classification, the proportion of male (3.1%) holders is higher than female (2.7%) holders. A similar pattern is observed for each age group for both males and females (Table 11.2).

Table 11.2: Forest tree holders 15 years or older by sex and age, and by type of market-oriented forest tree classification

Sex/Age of holder	Export and Domestic	Export only	Domestic only	Other	Total
Both Sexes	8,972	30	3,761	349	
Total	76.9	0.2	32.3	3.0	11,660
15-35	82.8	0.2	23.6	2.6	1,575
36-59	80.3	0.2	30.1	2.6	7,127
60+	65.9	0.2	42.1	4.0	2,958
Male					
Total	79.7	0.2	30.2	3.1	9,831
15-35	83.6	0.2	22.8	2.5	1,403
36-59	82.7	0.2	28.4	2.7	6,049
60+	69.8	0.1	39.1	4.2	2,379
Female					
Total	62.1	0.4	43.3	2.7	1,829
15-35	76.7	0.0	29.7	3.5	172
36-59	66.5	0.3	39.3	2.2	1,078
60+	49.5	0.7	55.0	3.5	579

Policy-oriented classification

Only 1.3 percent of holders are cultivating forest trees classified as “Protected” species and 42.7 percent cultivate species classified as “Promoted”. The proportion of the youth (15-35 years) cultivating “Promoted” species (51.4%) is higher than any other age group of holders. A similar pattern is observed for male and female holders (Table 11.3).

Table 11.3: Forest tree holders 15 years or older by sex and age, and by type of policy-oriented forest tree classification

Sex/Age of holder	Protected	Promoted	Common species	Total
Both Sexes	154	4,981	7,977	
Total	1.3	42.7	68.4	11,660
15-35	1.5	51.4	56.4	1,575
36-59	1.4	46.0	66.0	7,127
60+	1.2	30.4	80.6	2,958
Male				
Total	1.4	44.0	67.8	9,831
15-35	1.6	52.1	55.5	1,403
36-59	1.4	46.9	65.8	6,049
60+	0.9	32.0	80.3	2,379
Female				
Total	1.4	35.7	71.4	1,829
15-35	0.5	45.9	63.4	172
36-59	1.0	40.6	66.7	1,078
60+	2.6	23.5	82.6	579

11.3.3 Age and sex of forest tree holders

The participation of young holders (less than 36 years) in forest tree cultivation is minimal. Holders (86.5%) engaged in forest tree cultivation are 36 years or older for all types of market-oriented classification and for males and females in both urban and rural areas.

More than 50.0 percent of forest tree holders are in the age group of 36-59 years while holders 60 years or older range from 11.1 percent, among holders in urban areas growing forest trees classified as “Export and Domestic”, to 44.7 percent, among holders in urban areas growing forest trees classified as “Export only”. A similar pattern is observed for males and females for all classifications and also for holders aged 36 years or older for both females and males (Table 11.4).

Table 11.4: Forest tree holders 15 years or older by sex and age, and by type of market-oriented forest tree classification and type of locality

Age group	Export and Domestic		Export only		Domestic only		Other		Forest trees		Total
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Both Sexes	9	21	329	3,432	1,369	7,603	106	243	1687	9994	11681
15-19	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1
20-24	0.0	4.8	0.3	0.6	0.3	0.8	0.9	0.0	0.3	0.8	0.7
25-29	0.0	4.8	1.5	2.6	1.6	4.2	0.9	6.2	1.5	3.9	3.5
30-35	0.0	4.8	3.6	7.1	6.9	10.5	7.5	7.0	6.3	9.7	9.2
36-59	88.9	52.3	49.9	57.6	62.8	63.9	55.8	53.1	60.2	61.2	61.1
60+	11.1	33.3	44.7	32.0	28.3	20.5	34.9	33.7	31.6	24.3	25.4
Male	5	17	245	2,723	1,166	6,670	92	208	1402	8446	9848
15-19	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
20-24	0.0	5.9	0.0	0.7	0.3	0.9	1.1	0.0	0.3	0.9	0.8
25-29	0.0	5.9	1.6	2.8	1.7	4.2	1.1	6.3	1.6	4.0	3.7
30-35	0.0	5.9	4.5	7.6	6.8	10.9	8.7	6.3	6.5	10.2	9.7
36-59	80.0	64.7	50.2	58.6	63.3	63.8	56.5	54.2	60.7	61.7	61.5
60+	20.0	17.6	43.7	30.2	27.8	20.1	32.6	33.2	30.9	23.1	24.2
Female	4	4	84	709	203	933	14	35	285	1548	1833
15-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1
20-24	0.0	0.0	1.2	0.1	0.0	0.4	0.0	0.0	0.4	0.3	0.3
25-29	0.0	0.0	1.2	1.6	1.0	3.9	0.0	5.7	1.1	2.9	2.6
30-35	0.0	0.0	1.2	5.1	7.4	8.0	0.0	11.4	5.3	6.7	6.5
36-59	100.0	0.0	48.8	54.0	60.1	63.8	50.0	45.8	57.8	58.9	58.8
60+	0.0	100.0	47.6	39.2	31.5	23.9	50.0	37.1	35.0	31.1	31.7

11.3.4 Youth holders in the cultivation of forest trees

Most of the youth holders in the cultivation of forest trees are in the age group of 25-35 years for all types of forest tree classification. Majority of forest tree crop holders who are youth (15-35 years) are males. There is no female youth engaged in the growing of forest trees classified as “Export and Domestic”. There are more youth holders in the cultivation of forest trees in the rural than in urban areas, with the proportion cultivating forest trees classified as “Domestic only” (15.6%) and “Export and Domestic” (14.3%) being the highest. Female youth are mainly into the cultivation of forest trees classified as “Domestic only” (Table 11.5).

Table 11.5: Forest tree holders 15-35 years (youth) by sex and age, and by type of market-oriented forest tree classification and type of locality

Age group	Export and Domestic		Export only		Domestic only		Other	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
All holders	9	21	329	3,432	1,369	7,603	106	243
Both Sexes	0	3	18	353	121	1,184	10	32
15-19	0	0	0	3	1	5	0	0
20-24	0	1	1	20	4	62	1	0
25-29	0	1	5	88	22	317	1	15
30-35	0	1	12	242	94	800	8	17
Youth								
15-24	0	1	1	23	5	67	1	0
15-35	0	3	18	353	121	1,184	10	32
Male	0	3	15	305	104	1,069	10	26
15-19	0	0	0	3	1	5	0	0
20-24	0	1	0	19	4	58	1	0
25-29	0	1	4	77	20	281	1	13
30-35	0	1	11	206	79	725	8	13
Youth								
15-24	0	1	0	22	5	63	1	0
15-35	0	3	15	305	104	1,069	10	26
Female	0	0	3	48	17	115	0	6
15-19	0		0	0	0	0	0	0
20-24	0	0	1	1	0	4	0	0
25-29	0	0	1	11	2	36	0	2
30-35	0	0	1	36	15	75	0	4
Youth								
15-24	0	0	1	1	0	4	0	0
15-35	0	0	3	48	17	115	0	6
Percent of population								
15-24	0.0	4.8	0.3	0.7	0.4	0.9	0.9	0.0
15-35	0.0	14.3	5.5	10.3	8.8	15.6	9.4	13.2
Sex composition								
Youth 15-24	0.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Male	0.0	100.0	0.0	95.7	100.0	94.0	100.0	0.0
Female	0.0	0.0	100.0	4.3	0.0	6.0	0.0	0.0
Youth 15-35	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1
Male	0.0	100.0	83.3	86.4	86.0	90.3	100.0	81.3
Female	0.0	0.0	16.7	13.6	14.0	9.7	0.0	18.8

11.3.5 Educational attainment and market-oriented classification of holders

About 29.0 percent of forest tree holders have never attended school and 5.5 percent have attained tertiary education. More than one-third of holders who cultivate species classified as “Domestic only” have never attended school while for all other species, the proportion who have never attended school is at most a one-quarter. About 55 percent of holders of all type of species have attained basic education with the exception of holders who cultivate species classified as “Export only” (63.3%) where the proportion is higher. Species classified as “Export only” have the highest proportion of holders (13.3%) who have attained tertiary

education while those who cultivate species classified as “Domestic only” have the least proportion of holders who have attained tertiary education.

The proportion of female holders (52.2%) who have never attended school is more than twice the proportion of male holders (24.8%). This is true among holders who cultivate species classified as “Domestic Only” and “Export and Domestic” and contrasts those who cultivate species classified as “Export Only”, where the proportion of male holders who have never attended school is twice the proportion of female holders. (Table 11.6).

Table 11.6: Forest tree holders 15 years or older by sex and educational attainment, and by type of market-oriented forest tree classification

Sex/Highest educational level of holders	Export and Domestic	Export Only	Domestic Only	Other	Total	N
Both Sexes	8,972	30	3,761	349	13,112	
Never been to school	25.8	20.0	37.1	20.9	28.9	3,457
Basic education	55.0	63.3	54.9	54.2	54.9	6,364
Secondary/Vocational education	11.6	3.3	5.2	12.6	9.8	1,115
Post-secondary diploma	1.1	0.0	0.4	1.4	0.9	102
Tertiary	6.5	13.3	2.5	10.9	5.5	622
Male	7,836	22	2,968	300	11,126	9,831
Never been to school	23.0	22.7	29.8	22.0	24.8	2,499
Basic education	56.0	54.5	60.4	50.3	57.0	5,584
Secondary/Vocational education	12.6	4.5	6.3	14.7	11.0	1,059
Post-secondary diploma	1.2	0.0	0.5	1.7	1.0	98
Tertiary	7.1	18.2	3.1	11.3	6.2	591
Female	1,136	8	793	49	1,986	1,829
Never been to school	45.5	12.5	64.4	14.3	52.2	958
Basic education	47.4	87.5	34.3	77.6	43.1	780
Secondary/Vocational education	4.4	0.0	1.0	0.0	2.9	56
Post-secondary diploma	0.3	0.0	0.1	0.0	0.2	4
Tertiary	2.4	0.0	0.1	8.2	1.6	31

11.3.6 Educational attainment of holders and policy-oriented classification of forest trees

Holders cultivating species classified under the policy-oriented classification as “Common species”, have the highest proportion (30.2%) who have never attended school. There is little difference in the proportion of holders who have attained basic education for each of the policy-oriented classification and this is similar for holders who have attained tertiary education. A similar pattern is observed for male holders; but for female holders, the proportion that cultivates “Protected” species and have attained basic education is higher than all other species while there is no female holder cultivating “Protected” species who have attained tertiary education (Table 11.7).

Table 11.7: Forest tree holders 15 years or older by sex and educational attainment, and by type of policy-oriented forest tree classification

Sex/Highest educational level of holders	Protected	Promoted	Common species	Total	N
Both Sexes	154	4,981	7,977	13,112	
Never been to school	26.6	26.9	30.2	28.9	3,457
Basic education	57.8	55.7	54.4	54.9	6,364
Secondary education	10.4	11.5	8.7	9.8	1,115
Post-secondary diploma	0.0	0.9	0.9	0.9	102
Tertiary	5.2	5.0	5.8	5.5	622
Male	128	4,328	6,670	11,126	9,831
Never been to school	22.7	23.4	25.7	24.8	2,499
Basic education	59.4	57.2	56.9	57.0	5,584
Secondary education	11.7	12.7	9.9	11.0	1,059
Post-secondary diploma	0.0	1.0	1.0	1.0	98
Tertiary	6.3	5.7	6.5	6.2	591
Female	26	653	1,307	1,986	1,829
Never been to school	46.2	49.9	53.4	52.2	958
Basic education	50.0	45.8	41.6	43.1	780
Secondary education	3.8	3.5	2.6	2.9	56
Post-secondary diploma	0.0	0.2	0.2	0.2	4
Tertiary	0.0	0.6	2.1	1.6	31

11.3.7 Type of locality and educational attainment of forest tree holders

Majority of forest tree holders have either never attended school (29.0%) or have attained basic level of education (54.8%) while 9.7 percent have attained secondary/vocational education. The proportions of holders who have attained basic education or have never attended school are higher in rural areas (55.3% and 30.6% respectively) than in urban areas (52.4% and 19.3% respectively). The proportion of holders who have attained tertiary education is more than two times higher among holders in the urban areas (13.2%) than in rural areas (4.2%). Similar patterns are observed among holders who never attended school and those who have attained basic level of education within the various forest tree classifications. The proportion of holders in rural areas who grow “Export only” is (92.7%) while holders in urban areas growing “Domestic only” classification of forest trees is (69.6%).

The proportion of female holders who have never attended school (52.0%) is twice as high as males (24.7%) while the proportion of males who have attained secondary/vocational education (11.0%) is about 5 times higher than females (2.9%). Also, educational attainment beyond the basic level is low among females in both rural and urban areas and among all types of classifications compared to males (Table 11.8).

Table 11.8: Forest tree holders 15 years or older by sex and educational attainment, and by type of market-oriented forest tree classification and type of locality

Educational attainment/ Sex of holder	Export and Domestic		Export only		Domestic only		Other		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Both Sexes	9	21	329	3,432	1,369	7,603	106	243	1687	9,994	11,681
Never attended	22.2	19.0	30.4	37.7	17.5	27.4	7.5	26.7	19.3	30.6	29.0
Basic education	66.7	61.9	53.2	55.0	52.1	55.5	50.9	55.6	52.4	55.3	54.8
Secondary/vocational	0.0	4.8	8.2	4.9	14.2	11.1	16.0	11.1	13.1	9.2	9.7
Post-secondary diploma	0.0	0.0	3.3	0.1	1.6	1.0	4.7	0.0	2.1	0.7	0.9
Tertiary	11.1	14.3	4.9	2.2	14.7	5.1	20.8	6.6	13.2	4.2	5.5
Male	5	17	245	2,723	1,166	6,670	92	208	1402	8,446	9,848
Never attended	40.0	17.6	20.0	30.6	15.0	24.4	8.7	27.9	15.5	26.2	24.7
Basic education	40.0	58.8	59.6	60.4	51.6	56.8	45.7	52.4	52.6	57.8	57.0
Secondary/vocational	0.0	5.9	9.8	5.9	15.4	12.2	18.5	13.0	14.6	10.4	11.0
Post-secondary diploma	0.0	0.0	4.1	0.2	1.8	1.1	5.4	0.0	2.4	0.8	1.0
Tertiary	20.0	17.6	6.5	2.8	16.1	5.6	21.7	6.7	14.9	4.8	6.3
Female	4	4	84	709	203	933	14	35	285	1,548	1,833
Never attended	0.0	25.0	60.7	64.9	31.5	48.6	0.0	20.0	37.5	54.7	52.0
Basic education	100.0	75.0	34.5	34.3	54.7	45.9	85.7	74.3	51.2	41.7	43.2
Secondary/vocational	0.0	0.0	3.6	0.7	6.9	3.9	0.0	0.0	5.6	2.5	2.9
Post-secondary diploma	0.0	0.0	1.2	0.0	0.5	0.2	0.0	0.0	0.7	0.1	0.2
Tertiary	0.0	0.0	0.0	0.1	6.4	1.5	14.3	5.7	4.9	1.0	1.6

Literacy status of holders of forest trees

More than 52.0 percent of forest tree holders are literate in at least one language. Holders in the urban areas cultivating forest trees classified as “Domestic only” make the highest (74.6%) proportion of those literate. The proportion of forest tree holders in the urban areas who are literate are higher than those in rural areas for each type of forest tree classification.

English with a Ghanaian language is the most common literate domain in which forest tree holders can read and write with understanding. Most forest tree holders cannot read and write with understanding in English and French, the same is true for the English, French and a Ghanaian language literate domain. A similar pattern is observed for males and females.

With the exception of female holders in urban areas cultivating forest trees classified as “Domestic and Export”, the proportion of male holders who are literate are higher than female holders for all types of forest tree classifications (Table 11.9).

Table 11.9: Forest tree holders 15 years or older by sex, literacy status and language, and by type of market-oriented forest tree classification and type of locality

Literacy and sex	Export and Domestic		Export only		Domestic only		Other	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both Sexes								
Total	9	21	329	3,432	1,369	7,603	106	243
None (not literate)	33.3	47.6	40.1	41.8	25.4	43.0	13.2	30.0
Literacy	66.7	52.4	59.9	58.2	74.6	57.0	86.8	70.0
Literate								
English only	22.2	9.5	4.9	5.5	8.3	10.1	12.3	3.7
Ghanaian lang. only	0.0	4.8	12.8	23.1	12.4	7.3	11.3	17.7
Engl. & Ghanaian lang.	44.4	38.1	41.9	29.4	52.9	38.6	62.3	48.6
English and French	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Engl. Fren. & Ghanaian lang.	0.0	0.0	0.0	0.1	0.7	0.1	0.9	0.0
Other (Specify)	0.0	0.0	0.3	0.1	0.3	0.8	0.0	0.0
Male								
Total	5	17	245	2,723	1,166	6,670	92	208
None (not literate)	40.0	47.1	29.8	36.0	22.3	39.4	12.0	31.3
Literacy	60.0	52.9	70.2	64.0	77.7	60.6	88.0	68.8
Literate								
English only	20.0	11.8	5.3	6.5	7.9	11.0	10.9	3.4
Ghanaian lang. only	0.0	5.9	11.8	22.8	11.7	7.2	8.7	16.3
Engl. & Ghanaian lang.	40.0	35.3	53.1	34.4	57.0	41.3	67.4	49.0
English and French	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Engl. Fren. & Ghanaian lang.	0.0	0.0	0.0	0.1	0.8	0.1	1.1	0.0
Other (Specify)	0.0	0.0	0.0	0.1	0.3	0.9	0.0	0.0
Female								
Total	4	4	84	709	203	933	14	35
None (not literate)	25.0	50.0	70.2	64.0	43.3	68.7	21.4	22.9
Literacy	75.0	50.0	29.8	36.0	56.7	31.3	78.6	77.1
Literate								
English only	25.0	0.0	3.6	1.6	10.8	3.4	21.4	5.7
Ghanaian lang. only	0.0	0.0	15.5	24.1	16.7	7.8	28.6	25.7
Engl. & Ghanaian lang.	50.0	50.0	9.5	10.3	29.1	19.7	28.6	45.7
English and French	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engl. Fren. & Ghanaian lang.	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Other (Specify)	0.0	0.0	1.2	0.0	0.0	0.2	0.0	0.0

11.3.8 Nationality of holders

Almost all holders (99.8%) who are cultivating forest trees are Ghanaians. The non-Ghanaian holders engaged in the cultivation of forest trees are mostly in rural areas cultivating “Domestic only” type of forest tree classification (Table 11.10).

Table 11.10: Forest tree holders 15 years or older by nationality, and by type of market-oriented forest tree classification and type of locality

Nationality	Export and Domestic		Export only		Domestic only		Other		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Total	9	21	329	3,432	1,369	7,603	106	243	1687	9994	11681
Ghanaian	100.0	100.0	100.0	100.0	100.0	99.8	100.0	99.6	100.0	99.8	99.8
Non-Ghanaian	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.2	0.2
Non-Ghanaian											
<i>Burkina Faso</i>	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	16.7	16.7
<i>Cote d'Ivoire</i>	0.0	0.0	0.0	100.0	0.0	16.7	0.0	0.0	0.0	22.2	22.2
<i>Nigeria</i>	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	11.1	11.1
<i>Togo</i>	0.0	0.0	0.0	0.0	0.0	44.4	0.0	100.0	0.0	38.9	38.9
<i>Other African</i>	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	11.1	11.1

11.3.9 Disability status¹³ of holders of forest trees

About 10 percent of holders cultivating forest trees have some form of disability. Proportions range from no disability (0.0%) among holders growing “Export and Domestic” type of forest tree classification in urban areas to (14.3%) holders growing “Export and Domestic” type of forest tree classification in rural areas. A similar pattern is observed for males and females with the proportion of female holders who have some form of disability, higher than males for all types of classifications, except holders engaged in “other forest tree species of potential value yet to be known” type of classification (Table 11.11).

Table 11.11: Forest tree holders 15 years or older by sex and disability status, and by type of market-oriented forest tree classification and type of locality

Disability status	Market-oriented categories							
	Export and Domestic		Export only		Domestic only		Other	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Both sexes*								
Total	9	21	329	3,432	1,369	7,603	106	243
Without Disability	100.0	85.7	86.0	87.7	89.1	92.0	88.7	87.2
With Disability	0.0	14.3	14.0	12.3	10.9	8.0	11.3	12.8
Male								
Total	5	17	245	2,723	1,166	6,670	92	208
Without Disability	100.0	88.2	87.8	88.8	89.0	92.1	89.1	86.1
With Disability	0.0	11.8	12.2	11.2	11.0	7.9	10.9	13.9
Female								
Total	4	4	84	709	203	933	14	35
Without Disability	100.0	75.0	81.0	83.2	89.7	91.3	85.7	94.3
With Disability	0.0	25.0	19.0	16.8	10.3	8.7	14.3	5.7

* A holder may cultivate more than one category of forest trees.

11.4 Size of land parcels cultivated by holders of forest trees

About one-quarter of forest tree holders cultivate on parcels of sizes greater than 2 acres but less than 5 acres while about one-third cultivate on parcels of at least 20 acres. Only 15.3 percent of holders cultivate on parcels that are less than 2 acres. A similar pattern is observed for holders in rural areas however, for holders in the urban areas, 30.6 percent cultivate on parcels greater than 2 acres but less than 5 acres and one-fifth cultivate on parcels of sizes 20 acres or larger (Table 11.12).

More than half (53.4%) of holders who cultivate species classified as “Domestic Only”, use parcels that are at least 20 acres and 18.1 percent cultivate on parcels that are larger than 10 acres but less than 20 acres. Among holders who cultivate species classified as “Export and Domestic”, about one-quarter (24.3%) use parcels that are at least 20 acres while 10.5 percent use parcels with sizes ranging from 10 acres to less than 20 acres. Further, two-fifth of holders who cultivate species classified as “Export only” use parcels that are less than 5 acres but greater than 2 acres while 30.0 percent use parcels that are at least 20 acres in size. A similar pattern is observed for both urban and rural areas (Table 11.12).

¹³ Analysis on the type of disability for forest tree holders is not discussed because the number with some disability conditions is low when classified by the various types of disability and locality.

Table 11.12: Land parcels by size (acres), and by type of market-oriented forest tree classification and type of locality

Land size acres	Export only			Domestic only			Export and Domestic			Other			Total			N
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	
Total	9	21	30	329	3,432	3,761	1,369	7,603	8,972	106	243	349	1,680	9,980	11,660	
<2	22.2	14.3	16.7	12.2	10.8	10.9	18.6	16.9	17.1	8.5	16.5	14	18.1	17.0	17.2	2,001
2 <5	22.2	47.6	40	17	13.9	14.2	34.6	29.7	30.4	20.8	23	22.3	33.0	28.1	28.8	3,353
5 <10	0.0	9.5	6.7	4.6	3.4	3.5	18.5	17.5	17.7	13.2	12.3	12.6	16.8	14.8	15.1	1,763
10 <20	11.1	4.8	6.7	23.7	17.5	18.1	14.2	9.8	10.5	18.9	14	15.5	17.5	13.9	14.4	1,679
20+	44.4	23.8	30	42.6	54.4	53.4	14.1	26.1	24.3	38.7	34.2	35.5	22.4	39.4	37.0	4,316

About 41 percent of holders cultivate “Protected” species on parcels that are 20 acres or larger while 29.2 percent cultivate on parcels greater than 2 acres but less than 5 acres. Almost half of holders in rural areas cultivating “Protected” species use parcel sizes that are 20 acres or larger compared to 15.8 percent of their counterparts in urban areas. Among holders who cultivate “Protected” species in the urban areas, the proportion that cultivate on parcels sizes ranging from 2 to 5 acres, is the highest (47.4%) and it is about twice the proportion for their counterparts in rural areas (23.3%).

About the same proportion of holders who cultivate “Promoted” species use parcels that are 20 acres or larger (28.9%) and parcels greater than 2 acres but less than 5 acres (28.5%), see Table 11.13.

Table 11.13: Land parcels by size (acres), and by type of policy-oriented forest tree classification and type of locality

Land size acres	Protected			Promoted			Common Species			Total			Total
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	
Total	38	116	154	279	4,702	4,981	1,496	6,481	7,977	1,680	9,980	11,660	
<2	10.5	10.3	10.4	21.5	13.6	14.0	16.1	16.1	16.1	18.1	17.0	17.2	2,001
2 <5	47.4	23.3	29.2	25.1	28.8	28.5	31.1	21.9	23.6	33.0	28.1	28.8	3,353
5 <10	18.4	8.6	11.0	14.7	19.0	18.7	15.6	8.9	10.2	16.8	14.8	15.1	1,763
10 <20	7.9	8.6	8.4	14.7	9.5	9.8	16.7	14.3	14.8	17.5	13.9	14.4	1,679
20+	15.8	49.1	40.9	24.0	29.2	28.9	20.4	38.7	35.3	22.4	39.4	37.0	4,316

11.5 Scale of operation

More than two-thirds of holders use large-scale land parcels for the cultivation of forest trees species that are classified as “Domestic only” and about half use same for the cultivation of species classified as “Export and Domestic”. About one-third of holders use medium-scale parcels for the cultivation of species classified as “Export and Domestic” and the corresponding proportion for forest trees classified as “Export only” is 20.0 percent. Small-scale parcels are more common in the cultivation of species classified as “Export only” (40.0%) than in any of the other classification, which on the average is 18.3 percent of holders (Figure 11.4).

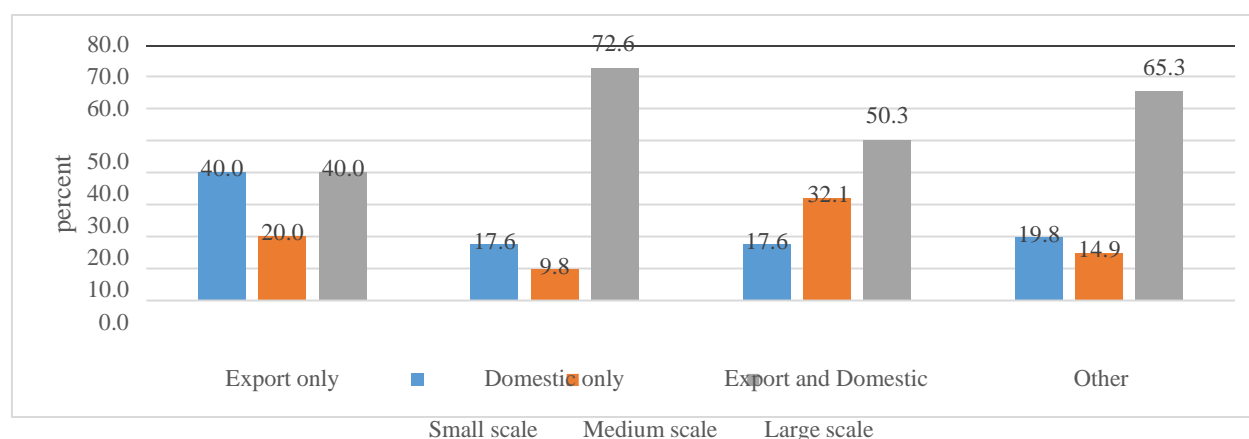
The scale of operation refers to size (in acres) of land parcels, and is classified as; small, medium or large.

Small-scale: Land parcel of sizes that are less than or equal to 2 acres.

Medium-scale: Land parcels of sizes greater than 2 acres but less than 5 acres.

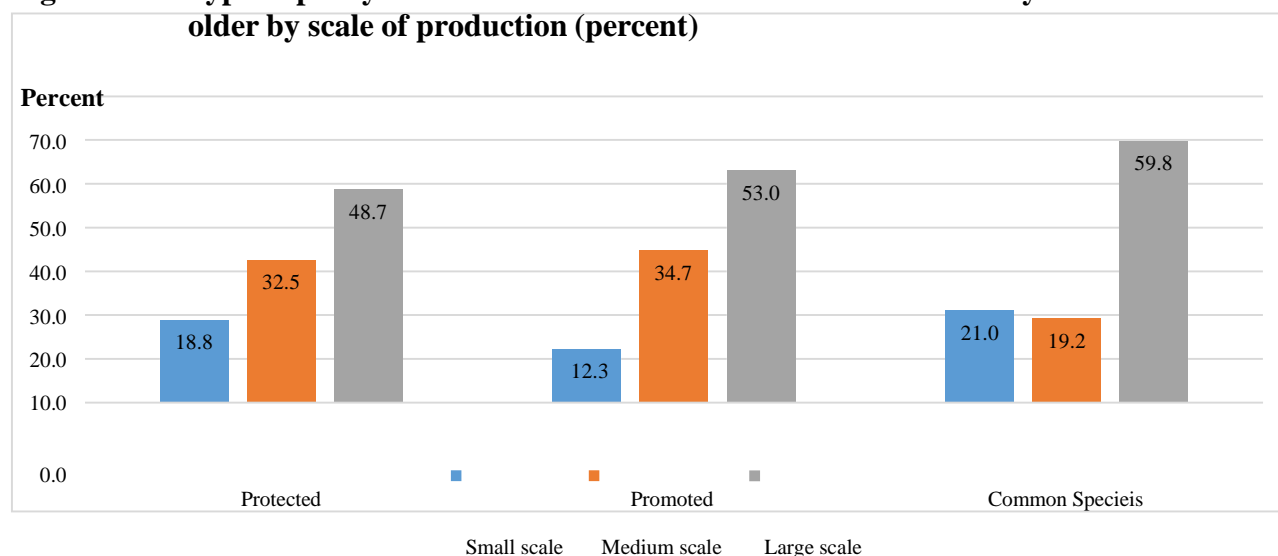
Large-scale: Land parcels of sizes greater than 5 acres.

Figure 11.4: Type of market-oriented forest tree classification of holders 15 years or older by scale of production (percent)



Large-scale parcels are used by more than half (53.0%) of holders who cultivate species that are being promoted by the Forestry Commission and about one-third use medium-scale in cultivating “Promoted” species while 12.3 percent use small-scale parcels to cultivate “Promoted” species. A similar pattern is observed among holders who cultivate “Protected” species (Figure 11.5).

Figure 11.5: Type of policy-oriented forest tree classification of holders 15 years or older by scale of production (percent)



Scale of operation, market-oriented classification and type of locality

Majority of forest tree holders cultivate on large-scale (57.1%) parcels while about a quarter cultivate on medium-scale parcels. This pattern holds for urban and rural areas with little differences in the proportions. A similar pattern is observed for holders who cultivate forest trees classified as “Export and Domestic”. For the other classifications (“Export only” and “Domestic only”), the proportion of holders cultivating on small-scale parcels is second highest to those who cultivate on large-scale parcels and the proportion of holders in urban areas is higher than rural areas (Table 11.14).

Table 11.14: Forest tree holders 15 years or older by scale of production, and by type of market-oriented forest tree classification and type of locality

Land size	Export and Domestic		Export only		Domestic only		Other		Total		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total
Total	1,369	7,603	9	21	329	3,432	106	243	1,680	9,980	11,660
Small-scale	19.4	17.2	44.4	38.1	18.2	17.5	15.1	21.8	20.6	19.7	19.8
Medium scale	30.1	32.5	11.1	23.8	11.2	9.7	14.2	15.2	27.6	28.5	28.4
Large-scale	50.5	50.3	44.4	38.1	70.5	72.8	70.8	63	59.7	65.0	64.2

Scale of operation, policy-oriented classification and type of locality

Majority of holders who produce tree species that are classified as “Promoted” by the Forestry Commission cultivate on large-scale parcels in both urban (58.1%) and rural (52.7%) areas while about one-third cultivate on parcels that are medium-scale parcels (34.7%). For those who cultivate species that are classified as “Protected”, majority cultivate on large-scale parcels in rural areas (54.3%), followed by those who cultivate on medium-scale parcels (25.9%) while in urban areas majority cultivate on medium-scale parcels (52.6%), followed by large-scale parcels (31.6%), see Table 11.15.

Table 11.15: Forest tree holders 15 years or older by scale of production, and by type of policy-oriented forest tree classification and type of locality

Land size	Protected			Promoted			Common Species			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	38	116	154	279	4,702	4,981	1,496	6,481	7,977	1,680	9,980	11,660
Small-scale	15.8	19.8	18.8	11.8	12.3	12.3	20.5	21.1	21.0	20.6	19.7	19.8
Medium-scale	52.6	25.9	32.5	30.1	35.0	34.7	24.1	18.1	19.2	27.6	28.5	28.4
Large-scale	31.6	54.3	48.7	58.1	52.7	53.0	55.3	60.8	59.8	59.7	65.0	64.2

11.6 Types of land tenure arrangements

The common types of land tenure arrangements for the cultivation of forest trees are ownership through freehold (59.0%), and through inheritance (27.5%) with share-cropping (11.8%) which together constitute 98.3 percent. A similar pattern is observed for both male and female holders who cultivate species classified as “Export and Domestic”. For those who cultivate species classified as “Export Only”, the third highest proportion of holders are those engaged in trusteeship arrangement (10.0%) while for those who cultivate species classified as “Domestic only”, the third highest proportion of holders are those engaged in renting tenure arrangement (15.6%) with (15.5%) for males and (16.2%) for females.

For male holders who cultivate species classified as “Export only”, the third highest proportion are those engaged in leasehold tenure arrangement (9.1%) and for their female counterparts it is share-cropping (12.5%), see Table 11.16.

Table 11.16: Forest tree holders 15 years or older by sex and type of land tenure arrangement, and by type of market-oriented forest tree classification

Sex/Tenure type	Market-oriented Classification				Total
	Export and Domestic	Export only	Domestic only	Other	
Both Sexes					
Total	8,891	30	3,745	348	11,660
Own/Freehold	54.6	46.7	48.5	56.0	59.0
Inheritance	25.3	26.7	23.2	23.0	27.5
Leasehold	3.5	6.7	3.8	7.5	4.1
Renting	0.8	3.3	15.6	1.7	5.7
Share-cropping	13.5	6.7	3.9	9.2	11.8
Squatting	0.5	0.0	2.1	0.0	1.1
Trusteeship	1.2	10.0	2.7	2.3	1.9
Other	0.5	0.0	0.1	0.3	0.4
Male					
Total	7,801	22	2,957	300	9,831
Own/Freehold	55.4	59.1	49.1	57.3	60.7
Inheritance	23.8	13.6	23.4	23.3	26.6
Leasehold	3.7	9.1	3.9	7.7	4.3
Renting	0.8	4.5	15.5	1.3	5.3
Share-cropping	14.2	4.5	3.8	9.0	12.7
Squatting	0.6	0.0	1.7	0.0	0.9
Trusteeship	1.3	9.1	2.7	1.3	1.9
Other	0.3	0.0	0.0	0.0	0.2
Female					
Total	1,090	8	788	48	1,829
Own/Freehold	48.7	12.5	46.6	47.9	50.3
Inheritance	36.0	62.5	22.5	20.8	31.9
Leasehold	2.6	0.0	3.8	6.3	3.4
Renting	0.8	0.0	16.2	4.2	7.6
Share-cropping	8.5	12.5	4.2	10.4	7.2
Squatting	0.5	0.0	3.7	0.0	1.9
Trusteeship	1.2	12.5	2.9	8.3	2.2
Other	1.7	0.0	0.1	2.1	1.2

The tenure arrangement for the cultivation of “Protected” or “Promoted” species are similar to the general tenure arrangement for the cultivation of forest trees, where ownership by freehold constitute the highest proportion of holders, followed by ownership through inheritance and sharecropping. The third common land tenure arrangements for those who cultivate species classified as “common species” is renting. A similar pattern is observed for males, but for females who cultivate “Protected” species, the third highest proportion is renting or trusteeship arrangements (Table 11.17).

Table 11.17: Forest tree holders 15 years or older by sex and type of land tenure arrangement, and by type of policy-oriented forest tree classification

Sex/Tenure type	Tree Classification			Total
	Protected	Promoted	Common Species	
Both Sexes				
Total	154	4,981	7,977	11,660
Own/Freehold	63.0	55.0	51.3	59.0
Inheritance	13.6	24.1	25.2	27.5
Leasehold	3.9	3.4	4.0	4.1
Renting	4.5	0.1	8.2	5.7
Share-cropping	14.3	16.5	6.9	11.8
Squatting	0.0	0.2	1.5	1.1
Trusteeship	0.6	0.7	2.4	1.9
Other	0.0	0.0	0.6	0.4
Male				
Total	128	4,300	6,652	9,831
Own/Freehold	62.5	56.2	52.0	60.7
Inheritance	10.9	21.8	25.1	26.6
Leasehold	4.7	3.6	4.0	4.3
Renting	4.7	0.1	7.7	5.3
Share-cropping	17.2	17.4	7.2	12.7
Squatting	0.0	0.2	1.3	0.9
Trusteeship	0.0	0.7	2.3	1.9
Other	0.0	0.0	0.4	0.2
Female				
Total	26	624	1,284	1,829
Own/Freehold	65.4	47.0	47.7	50.3
Inheritance	26.9	39.4	25.8	31.9
Leasehold	0.0	1.9	3.8	3.4
Renting	3.8	0.0	10.7	7.6
Share-cropping	0.0	10.1	5.4	7.2
Squatting	0.0	0.3	2.5	1.9
Trusteeship	3.8	1.1	2.6	2.2
Other	0.0	0.2	1.6	1.2

11.7 Production of forest trees

A total of 57,220,809 forest trees were grown during 2017/18 cropping season of which 51,520,439, constituting 90 percent, were cultivated by holders in rural areas. Species classified as “Export and Domestic” had the highest number (10,671,632) of forest trees grown. Among species classified as “Export and Domestic”, teak (49.6%) was the most common species grown, followed by ofram (17.2%) and mahogany (10.1%). Sapele (46.7%) and acacia (97.3%) were the most common among species classified as “Export only” and “Domestic only” respectively.

About 87.1 percent of forest trees classified as “Export and Domestic” grown by holders in urban areas was teak while about half (49.6%) was cultivated among holders in rural areas. For forest trees classified as “Export only”, sapele cultivation constituted 66.9 percent in urban areas and 46.7 percent in rural areas. For trees classified as “Domestic only”, acacia constituted 62.0 percent in urban areas and 97.3 percent in rural areas (Table 11.18).

Table 11.18: Quantity (single count) by type of market-oriented forest trees classification and type of specie, and by quantity produced and type of locality

Type of species	Number of Trees					
	Total		Urban		Rural	
	Number	%	Number	%	Number	%
All speciesl	57,220,809		5,700,370		51,520,439	
Export & Domestic	10,671,632	18.6	2,737,700	48.0	7,933,932	18.6
Teak	5,290,075	49.6	2,384,812	87.1	2,905,263	49.6
Ofram	1,840,326	17.2	64,347	2.4	1,775,979	17.2
Mahogany	1,077,856	10.1	84,639	3.1	993,217	10.1
Emeri	897,746	8.4	52,914	1.9	844,832	8.4
Cedrell	698,042	6.5	32,461	1.2	665,581	6.5
Odum	443,475	4.2	14,047	0.5	429,428	4.2
Wawa	156,043	1.5	45,931	1.7	110,112	1.5
Kuisa	74,406	0.7	16,960	0.6	57,446	0.7
Edinam	68,846	0.6	234	0.0	68,612	0.6
Ceiba	32,853	0.3	79	0.0	32,774	0.3
Utile	24,855	0.2	0	0.0	24,855	0.2
Bombax	22,379	0.2	18,240	0.7	4,139	0.2
Hyedua	20,201	0.2	20,000	0.7	201	0.2
White wood	14,573	0.1	2,601	0.1	11,972	0.1
Mansonia	4,202	0.0	201	0.0	4,001	0.0
Awimfosamit	3,119	0.0	23	0.0	3,096	0.0
Kyenkyen	1,177	0.0	105	0.0	1,072	0.0
Watapuo	948	0.0	56	0.0	892	0.0
Apro	510	0.0	50	0.0	460	0.0
Export Only	41,784	0.1	13,764	0.2	28,020	0.1
Sapele	19,496	46.7	9,209	66.9	10,287	46.7
Kokrodua	9,283	22.2	18	0.1	9,265	22.2
Iroko	8,480	20.3	2,097	15.2	6,383	20.3
Potrodom	2,508	6.0	2,200	16.0	308	6.0
Makore	2,017	4.8	240	1.7	1,777	4.8
Domestic Only	44,132,639	77.1	2,707,902	47.5	41,424,737	77.1
Acacia	42,937,240	97.3	1,679,486	62.0	41,257,754	97.3
Neem tree	1,159,624	2.6	1,026,314	37.9	133,310	2.6
Eucalyptus	21,524	0.0	2,052	0.1	19,472	0.0
Kapok	14,251	0.0	50	0.0	14,201	0.0
Other	2,374,754	4.2	241,004	4.2	2,133,750	4.2

CHAPTER TWELVE

AGRICULTURAL INSTITUTIONS

12.1 Introduction

This chapter presents information on agricultural activities undertaken by institutions and discusses the characteristics of agricultural institutions together with the land use practices, ownership and use of equipment within agricultural institutions. Information collected on major agricultural activities such as arable crops, tree crops, livestock, aquaculture, forest trees and capture fisheries are analysed in terms of number of persons engaged, parcels used, type of locality and volume of produce and sales.

12.2 Characteristics of agricultural institutions

12.2.1 Agricultural institutions and type of locality

Agricultural institutions are predominantly in rural areas. Out of 16,919 agricultural institutions, 63.0 percent are in rural areas. With the exception of capture fisheries where less than 50 percent of institutions are in rural areas, about 60 percent of all other agricultural activities are in rural areas. (Table 12.1).

An agricultural institution is an establishment (as opposed to households) engaged in any number of agricultural activities.

Table 12.1: Agricultural institutions by type of activity and type of locality (proportion urban and rural)

Type of Agricultural activity	Urban	Rural	Total
Number of all institutions	6,263	10,656	16,919**
Total	37.0	63.0	100.0
Arable crops	35.2	64.8	10,299
Tree crops	40.4	59.6	5,019
Livestock*	36.9	63.1	3,334
Aquaculture	36.5	63.5	126
Forest trees	36.2	63.8	329
Capture fisheries	52.1	47.9	119

* Includes bee-keeping

** Agricultural institutions may engage in more than one activity

12.2.2 Agricultural institutions and type of activity

Agricultural institutions largely rear livestock and cultivate arable and tree crops. The proportion cultivating arable crops is 60.9 percent while about 30 percent grow tree crops, and about 20 percent rear livestock. Similarly, for institutions in both urban and rural areas, the predominant activity is arable cropping, followed by tree cropping. However, while arable crops (62.6%) constitute a higher proportion in rural than in urban areas (57.8%) the opposite is true for tree crops (28.1% and 32.4% respectively), see Table 12.2.

**Table 12.2: Agricultural institutions by type of activity and type of locality
(Share in activity)**

Type of agricultural activity	Urban		Rural		Total	
	Number	%	Number	%	Number	% ⁺
All Institutions	6,263		10,656		16,919	
Arable crops	3,623	57.8	6,675	62.6	10,298	60.9
Tree crops	2,028	32.4	2,991	28.1	5,019	29.7
Livestock*	1,212	19.4	2,060	19.3	3,272	19.3
Aquaculture	69	1.1	80	0.8	149	0.9
Forest trees	119	1.9	210	2.0	329	1.9
Capture fisheries	51	0.8	45	0.4	96	0.6

* Includes bee-keeping

⁺The sum of the percentages across activities exceeds 100 due to multiple activities engaged by some agricultural institutions.

Nearly nine in ten (88.2%) agricultural institutions are engaged in one agricultural activity while approximately 10 percent are engaged in two, with less than 2 percent engaged in three or more agricultural activities. This is the case in both urban and rural areas (Table 12.3).

Table 12.3: Agricultural institutions by number of activities and type of locality

Number of agricultural activities	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Total	6,263	100.0	10,656	100.0	16,919	100.0
1	5,522	88.2	9,394	88.2	14,916	88.2
2	647	10.3	1,084	10.2	1,731	10.2
3	77	1.2	149	1.4	226	1.3
4	13	0.2	23	0.2	36	0.2
5+	4	0.1	6	0.1	10	0.1

12.2.3 Persons engaged by agricultural institutions and type of agricultural activity

Agricultural institutions engaged 380,248 persons who were directly involved in agricultural activities of which 63.7 percent are males and about 75.0 percent are in rural areas. A similar pattern is observed for all types of agricultural activities.

More than half (57.5%) of persons directly involved in agricultural activities are engaged in arable crops of which 60.8 percent are males. The proportion of persons directly involved in agricultural activities

Persons engaged by an agricultural institution comprise employees and farm hands (temporarily workers).

Institutions may engage the same person for different agricultural activities at different points in time within the reference period.

who are engaged in tree crop cultivation is 26.2 percent and livestock rearing is 10.4 percent (Table 12.4).

Table 12.4: Persons in agricultural institutions engaged in agriculture by type of activity, and by sex and type of locality

Type of agricultural activity	Sex	Type of locality				Number	Total	
		Urban		Rural			Sex composition within activity	Sex distribution across activities
		Number	%	Number	%		%	%
Total	Total	95,450	100.0	284,798	100.0	380,248**	100.0	100.0
	Male	64,511	67.6	177,565	62.3	242,076	63.7	100.0
	Female	30,939	32.4	107,233	37.7	138,172	36.3	100.0
Proportion urban or rural			25.1		74.9			
Arable crops	Total	46,522	100.0	172,015	100.0	218,537	100.0	57.5
	Male	30,322	65.2	102,643	59.7	132,965	60.8	54.9
	Female	16,200	34.8	69,372	40.3	85,572	39.2	61.9
Proportion urban or rural			21.3		78.7			
Tree crops	Total	28,507	100.0	70,978	100.0	99,485	100.0	26.2
	Male	20,040	70.3	46,091	64.9	66,131	66.5	27.3
	Female	8,467	29.7	24,887	35.1	33,354	33.5	24.1
Proportion urban or rural			28.7		71.3			
Livestock *	Total	12,092	100.0	27,287	100.0	39,379	100.0	10.4
	Male	8,823	73.0	19,738	72.3	28,561	72.5	11.8
	Female	3,269	27.0	7,549	27.7	10,818	27.5	7.8
Proportion urban or rural			30.7		69.3			
Aquaculture	Total	1,489	100.0	2,515	100.0	4,004	100.0	1.1
	Male	1,174	78.8	1,721	68.4	2,895	72.3	1.2
	Female	315	21.2	794	31.6	1,109	27.7	0.8
Proportion urban or rural			37.2		62.8			
Forest trees	Total	6,781	100.0	11,801	100.0	18,582	100.0	4.9
	Male	4,116	60.7	7,242	61.4	11,358	61.1	4.7
	Female	2,665	39.3	4,559	38.6	7,224	38.9	5.2
Proportion urban or rural			36.5		63.5			
Capture fisheries	Total	59	100.0	202	100.0	261	100.0	0.1
	Male	36	61.0	130	64.4	166	63.6	0.1
	Female	23	39.0	72	35.6	95	36.4	0.1
Proportion urban or rural			22.6		77.4			

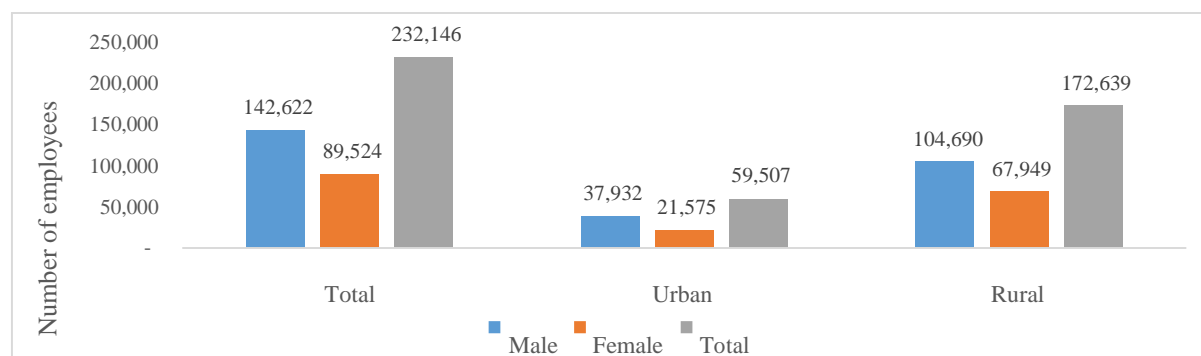
*Includes bee-keeping

**This is the total number of persons engaged and is less than the sum of employees in Table 12.5 and farm hands in Table 12.6. This is because a person engaged by an institution may have multiple assignment at different points in time during the reference period.

Employees of agricultural institutions

Of the 380,248 persons engaged, employees – those on payroll (232,146) – constitute 61.1 percent with 74.4 percent (172,639) in rural areas. In both urban and rural areas, more males than females are employed (Figure 12.1).

Figure 12.1: Male and female employees in agricultural institutions in rural and urban areas



Employees of agricultural institutions and type of agricultural activity

The proportion of females employed by agricultural institutions is 38.6 percent of which 75.9 percent are in rural areas. More than half of the employees of agricultural institutions are engaged in arable crop cultivation and about 80 percent are in rural areas. About one-third of the employees of agricultural institutions engaged in arable crop cultivation are males while a little over one-fifth are females. Among female employees engaged in arable crops, 80.9 percent of them are in the rural areas.

The proportion of employees of agricultural institutions engaged in tree crops is 16.6 percent, livestock is 9.9 percent and each of the other agricultural activities are less than 5 percent. For institutions engaged in arable and tree crops cultivation, about one-quarter of their employees are in urban areas while for those engaged in livestock, aquaculture and forest trees, a little over one third of the employees are in urban areas. More than three-quarters of the employees of agricultural institution engaged in capture fisheries are in urban areas (Table 12.5).

Table 12.5: Employees of agricultural institutions engaged in agriculture by type of activity and sex, and by type of locality

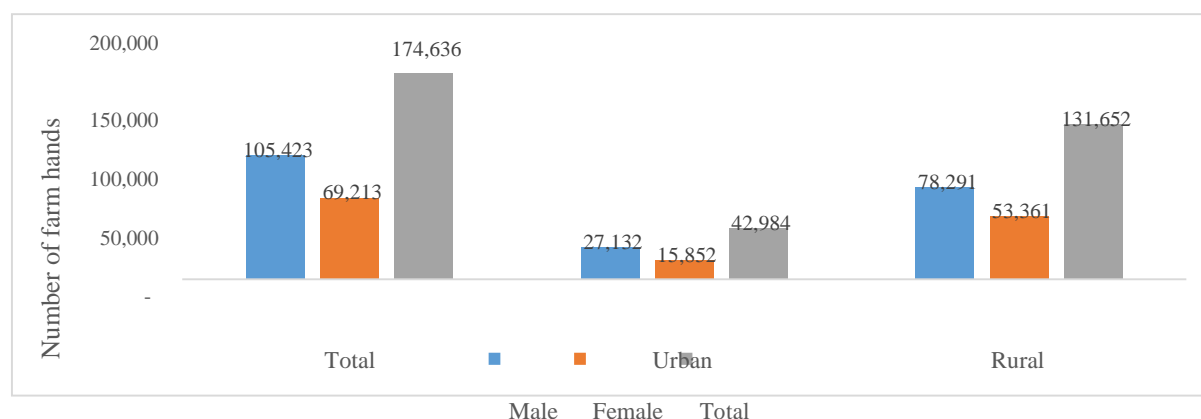
Type of crop	Sex	Urban		Rural		Total	
		Number	%	Number	%	Number	%
Total	Total	59,507	25.6	172,639	74.4	232,146	100
	Male	37,932	26.6	104,690	73.4	142,622	61.4
	Female	21,575	24.1	67,949	75.9	89,524	38.6
Arable crops	Total	26,127	20.2	103,002	79.8	129,129	55.6
	Male	16,066	21	60,493	79	76,559	33.0
	Female	10,061	19.1	42,509	80.9	52,570	22.6
Tree crops	Total	16,773	27.5	44,300	72.5	61,073	26.3
	Male	11,352	29.5	27,163	70.5	38,515	16.6
	Female	5,421	24	17,137	76	22,558	9.7
Livestock*	Total	8,106	35.1	14,959	64.9	23,065	9.9
	Male	5,637	34.9	10,537	65.1	16,174	7
	Female	2,469	35.8	4,422	64.2	6,891	3
Aquaculture	Total	2,203	42.1	3,031	57.9	5,234	2.3
	Male	1,316	41.4	1,864	58.6	3,180	1.4
	Female	887	43.2	1,167	56.8	2,054	0.9
Forest trees	Total	4,527	39.8	6,843	60.2	11,370	4.9
	Male	2,510	36.5	4,365	63.5	6,875	3
	Female	2,017	44.9	2,478	55.1	4,495	1.9
Capture fisheries	Total	1,771	77.8	504	22.2	2,275	1
	Male	1,051	79.7	268	20.3	1,319	0.6
	Female	720	75.3	236	24.7	956	0.4

* Includes bee-keeping

Farm hands of agricultural institutions and type of agricultural activity

A total of 174,636 farm hands were engaged by agricultural institutions of which 105,423 representing 60.4 percent are males and 131,652 (more than three-quarters) are in rural areas. More male than female farm hands are engaged by agricultural institutions in both urban and rural areas (Figure 12.2).

Figure 12.2: Male and female farm hands in agricultural institutions in rural and urban areas



The proportion of female farm hands engaged by agricultural institutions is 39.6 percent of which 77.1 percent are in rural areas. More than half of farm hands engaged by agricultural institutions are engaged in arable cropping with 80.3 percent found in rural areas. About one-third of male farm hands are engaged in cultivation of arable crops while a little over one-fifth are females. Among the female farm hands who are into arable crops, 81.2 percent are in rural areas.

The proportion of farm hands engaged by agricultural institutions for tree crop cultivation is 26.0 percent, 9.1 percent for livestock and less than 10 percent for all other agricultural activities combined (Table 12.6).

Table 12.6: Farm hands in agricultural institutions engaged in agriculture by type of activity and sex, and by type of locality

Type of crop	Sex	Urban		Rural		Total	
		Number	%	Number	%	Number	%
Total	Total	42,984	24.6	131,652	75.4	174,636	100.0
	Male	27,132	25.7	78,291	74.3	105,423	60.4
	Female	15,852	22.9	53,361	77.1	69,213	39.6
Arable crops	Total	19,462	19.7	79,097	80.3	98,559	56.4
	Male	11,645	20.5	45,294	79.5	56,939	32.6
	Female	7,817	18.8	33,803	81.2	41,620	23.8
Tree crops	Total	11,982	26.4	33,380	73.6	45,362	26.0
	Male	8,031	28.4	20,261	71.6	28,292	16.2
	Female	3,951	23.1	13,119	76.9	17,070	9.8
Livestock*	Total	5,374	33.7	10,571	66.3	15,945	9.1
	Male	3,840	34.1	7,409	65.9	11,249	6.4
	Female	1,534	32.7	3,162	67.3	4,696	2.7
Aquaculture	Total	1,530	38.9	2,404	61.1	3,934	2.3
	Male	1,001	41.2	1,430	58.8	2,431	1.4
	Female	529	35.2	974	64.8	1,503	0.9
Forest trees	Total	3,622	37.5	6,024	62.5	9,646	5.5
	Male	1,968	34.3	3,764	65.7	5,732	3.3
	Female	1,654	42.3	2,260	57.7	3,914	2.2
Capture fisheries	Total	1,014	85.2	176	14.8	1,190	0.7
	Male	647	82.9	133	17.1	780	0.4

Female	367	89.5	43	10.5	410	0.2
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* Includes bee-keeping

**A person could be a holder of more than one arable crop

12.3 Land use

12.3.1 Land tenure arrangements

The dominant type of land tenure arrangement used by institutions is ownership by freehold and inheritance in both urban and rural areas. This is true for arable and tree crops cultivation except for forestry where leasehold arrangements surpass inheritance generally, and are in urban areas only. Furthermore, land tenure arrangements for forest trees and tree crops vary significantly between urban and rural areas. For instance, while share-cropping (8.1%) dominates leasing (6.5%) and renting (2.8%) in the cultivation of tree crops, leasing (7.9%) is distantly higher than renting (1.9%) and share-cropping (1.3%) for the growing of forest trees.

The proportion of agricultural institutions renting land for the cultivation of arable crops, tree crops and forest trees is higher in urban areas (19.0%)) than rural areas (13.5%) while the proportion of institutions under share-cropping arrangement for the cultivation of arable, tree crops and forest trees in rural areas (13.4%) is higher than urban (11.4%), see Table 12.7.

Table 12.7: Agricultural institutions by type of locality and type of land tenure arrangement, and by type of agricultural activity

Type of land tenure/Type of	Arable crops		Tree crops		Forest trees		Total	
locality*	Number	%	Number	%	Number	%	Number	%
Total	12,416	100.0	6,458	100.0	467	100.0	16,945	100.0
Own/Freehold	7,700	62.0	4,366	67.6	365	78.2	10,844	64.0
Inheritance	1,362	11.0	849	13.1	23	4.9	1,908	11.3
Leasehold	898	7.2	422	6.5	37	7.9	1,225	7.2
Renting	1,345	10.8	179	2.8	9	1.9	1,432	8.5
Share-cropping	407	3.3	521	8.1	6	1.3	746	4.4
Squatting	282	2.3	23	0.4	0	0.0	296	1.7
Trusteeship	351	2.8	75	1.2	16	3.4	401	2.4
Other	71	0.6	23	0.4	11	2.4	93	0.5
Urban								
Total	4,361	100.0	2,639	100.0	181	100.0	6,267	100.0
Own/Freehold	2,741	62.9	1,796	68.1	145	80.1	4,061	64.8
Inheritance	388	8.9	426	16.1	1	0.6	699	11.2
Leasehold	291	6.7	115	4.4	16	8.8	384	6.1
Renting	573	13.1	83	3.1	5	2.8	614	9.8
Share-cropping	131	3.0	176	6.7	3	1.7	241	3.8
Squatting	112	2.6	10	0.4	0	0.0	117	1.9
Trusteeship	109	2.5	24	0.9	6	3.3	124	2.0
Other	16	0.4	9	0.3	5	2.8	27	0.4
Rural								
Total	8,055	100.0	3,819	100.0	286	100.0	10,678	100.0
Own/Freehold	4,959	61.6	2,570	67.3	220	76.9	6,783	63.5
Inheritance	974	12.1	423	11.1	22	7.7	1,209	11.3
Leasehold	607	7.5	307	8.0	21	7.3	841	7.9
Renting	772	9.6	96	2.5	4	1.4	818	7.7
Share-cropping	276	3.4	345	9.0	3	1.0	505	4.7
Squatting	170	2.1	13	0.3	0	0.0	179	1.7
Trusteeship	242	3.0	51	1.3	10	3.5	277	2.6
Other	55	0.7	14	0.4	6	2.1	66	0.6

* An institution is counted as many times as the number of different types of land tenure arrangements of parcels used

12.3.2 Documentation on land tenure arrangements

Most agricultural institutions do not have any documentation on their land tenure arrangements. For about 60 percent of parcels used by agricultural institutions, the terms for acquiring land is yet to be initiated and only one-third have completed the documentation on the land tenure arrangements. Across the different types of land tenure arrangements, trusteeship has the

highest proportion (84.5%) of parcels without any form of documentation followed by inheritance (78.6%) and renting (76.3%). The proportion of all land tenure arrangements without any form of documentation is higher in rural areas (63.3%) than urban (51.3%), see, Table 12.8.

Table 12.8: Agricultural institutions by type of locality and type of land tenure arrangement, and by status of documentation of the tenure arrangement

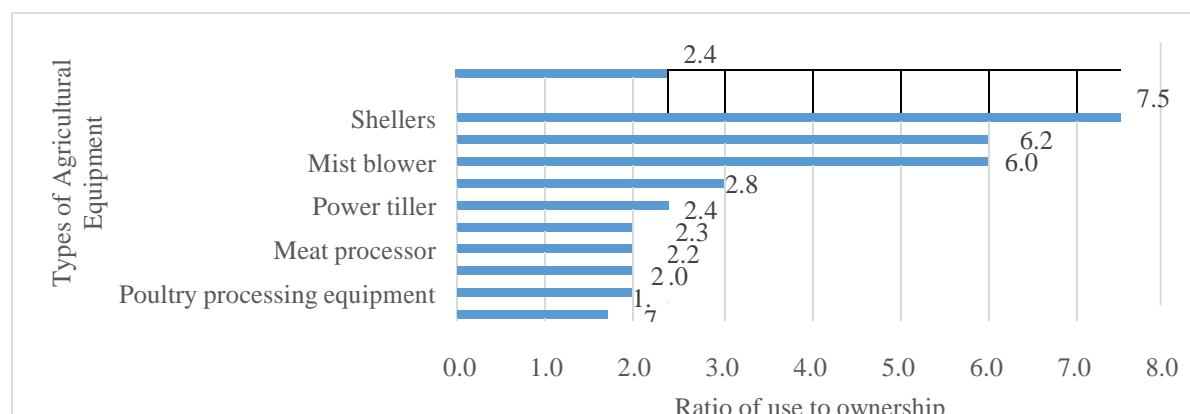
Type of land tenure/Type of locality	Status of documentation				Number of institutions Number
	Complete %	Yes, partial %	No, low processing %	No, not at all %	
Total	33.7	4.9	2.3	59.1	16,945
Own/Freehold	41.7	3.9	2.2	52.2	10,844
Inheritance	15.1	4.1	2.2	78.6	1,908
Leasehold	34.2	11.2	3.4	51.3	1,225
Renting	15.3	6.9	1.5	76.3	1,432
Share-cropping	24.9	9.7	5.2	60.2	746
Squatting	0.0	0.0	0.0	100.0	296
Trusteeship	10.8	3.5	1.3	84.5	401
Other	34.4	5.4	0.0	60.2	93
Urban					
Total	40.8	5.5	2.5	51.3	6,267
Own/Freehold	51.1	4.3	2.4	42.2	4,061
Inheritance	23.0	4.1	2.7	70.1	699
Leasehold	34.6	14.8	4.4	46.1	384
Renting	15.8	8.6	1.5	74.1	614
Share-cropping	25.7	10.8	5.0	58.5	241
Squatting	0.0	0.0	0.0	100.0	117
Trusteeship	14.5	2.4	0.8	82.3	124
Other	37.0	0.0	0.0	63.0	27
Rural					
Total	29.6	4.6	2.2	63.6	10,678
Own/Freehold	36.1	3.7	2.1	58.1	6,783
Inheritance	10.9	4.1	1.9	83.1	1,209
Leasehold	34.0	9.6	2.9	53.5	841
Renting	15.3	5.5	1.6	77.6	818
Share-cropping	24.6	9.1	5.3	61.0	505
Squatting	0.0	0.0	0.0	100.0	179
Trusteeship	9.0	4.0	1.4	85.6	277
Other	33.3	7.6	0.0	59.1	66

* An institution is counted as many times as the number of different types of land tenure arrangements of parcels used

12.4 Ownership and use of equipment

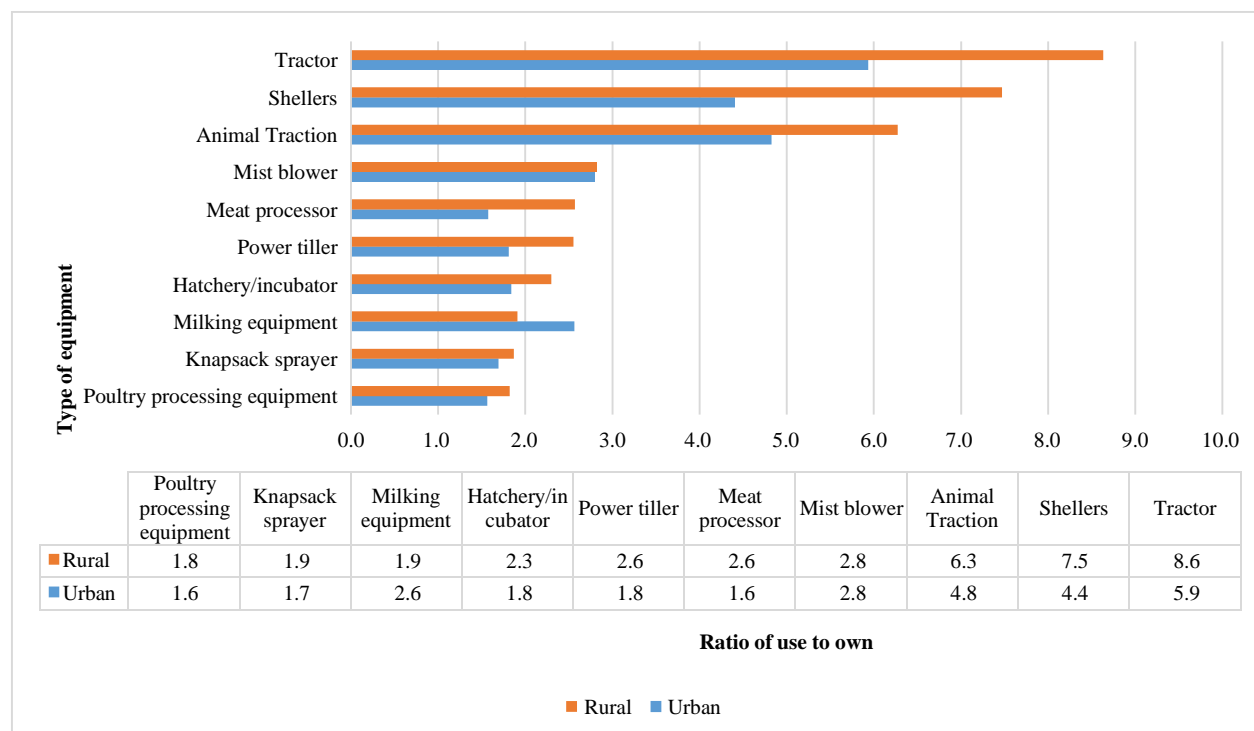
About 2.4 times more institutions use agricultural equipment as compared to owning equipment. Tractor (7.5 times as many use as own) is the agricultural equipment that most institutions use but do not own. Knapsack sprayer and poultry processing equipment used by agricultural institutions are mostly also owned by the institutions. The ratio of use to ownership for knapsack sprayer (1.8) and poultry processing equipment (1.7) indicating less than twice use as own (Figure 12.3).

Figure 12.3: Ratio of users to owners of types of agricultural equipment of agricultural institutions



In rural areas, more agricultural institutions use agricultural equipment (nine out of ten) not owned by the institution than in urban areas for each type of equipment. However, an exception occurs with milking equipment, where the ratio for urban areas is higher than in rural areas and for mist blower, for which the ratio is the same. The difference in the ratio between urban and rural areas are wider (at least by one point) for shellers (3.1), tractors (2.7) and animal traction (1.5), see Figure 12.4.

Figure 12.4: Ratio of users to owners of types of agricultural equipment of agricultural institutions by type of locality



Knapsack sprayer and mist blower are the agricultural equipment mostly used or owned by agricultural institutions in both urban and rural areas. A total of 12,558 representing 74.2 percent of all institutions use knapsack sprayer while about half of them (6,960) own knapsack sprayer. Similarly, 21.7 percent of agricultural institutions use mist blower while 7.7 percent own mist blowers. A similar pattern is observed for each type of agricultural equipment in both urban and rural areas (Table 12.9).

Table 12.9: Agricultural institutions by type of agricultural equipment, and by type of ownership and use of agricultural equipment and type of locality

Types of equipment	Ownership of equipment						Use of equipment*					
	Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
	6,263		10,656		16,919		6,263		10,656		16,919	
Animal traction	29	0.5	120	1.1	149	0.9	140	2.2	753	7.1	893	5.3
Tractor	190	3.0	282	2.6	472	2.8	1,128	18.0	2,434	22.8	3,562	21.1
Power tiller	58	0.9	87	0.8	145	0.9	105	1.7	222	2.1	327	1.9
Shellers	100	1.6	134	1.3	234	1.4	441	7.0	1,001	9.4	1,442	8.5
Knapsack sprayer	2,581	41.2	4,379	41.1	6,960	41.1	4,369	69.8	8,189	76.8	12,558	74.2
Mist blower	489	7.8	811	7.6	1,300	7.7	1,369	21.9	2,286	21.5	3,666	21.7
Hatchery/incubator	56	0.9	90	0.8	146	0.9	103	1.6	207	1.9	314	1.9
Milking equipment	23	0.4	11	0.1	34	0.2	59	0.9	21	0.2	80	0.5
Meat processor	26	0.4	21	0.2	47	0.3	41	0.7	54	0.5	95	0.6
Poultry processing equipment	78	1.2	113	1.1	191	1.1	122	1.9	206	1.9	328	1.9

*An institution may use more than one type of equipment

12.5 Aquaculture

12.5.1 Institutions in aquaculture and type of production system

There are 149 institutions engaged in aquaculture of which 80 are in rural areas. A total of 118 use the monoculture system of production. The common types of holding facilities used are pond (75.2%) and cage (16.1%) which together constitute 91.3 percent of all institutions. A similar pattern is observed among agricultural institutions using the monoculture system in both urban and rural areas. For institutions using the poly-culture system, the main facility is pond (93.5%), which is distantly followed by tank (6.5%). No institution uses the integrated system which is used by households in aquaculture (Table 12.10).

Table 12.10: Aquaculture institutions by type of holding facility, and by type of production system and type of locality

Type of holding facility	Monoculture			Poly-culture				Total				
	Urban	Rural	Total	Number	Urban	Rural	Total	Number	Urban	Rural	Total	Number
Total	62	56	118	118	7	24	31	31	69	80	149	149
Pond	82.3	57.1	70.3	83	85.7	95.8	93.5	29	82.6	68.8	75.2	112
Cage	6.5	35.7	20.3	24	0.0	0.0	0.0	0	5.8	25.0	16.1	24
Dam/Dug-out	6.5	3.6	5.1	6	0.0	0.0	0.0	0	5.8	2.5	4.0	6
Reservoir	0.0	1.8	0.8	1	0.0	0.0	0.0	0	0.0	1.3	0.7	1
Tank	4.8	1.8	3.4	4	14.3	4.2	6.5	2	5.8	2.5	4.0	6

12.5.2 Institutions in aquaculture and type of land tenure arrangements

A total of 107 out of the 149 aquaculture institutions own the holding facility being used. Among those who own the facility, 79.4 percent use pond and 10.3 percent use cage. A similar pattern is observed for institutions that lease the holding facility used in production (Table 12.11).

Table 12.11: Aquaculture institutions by type of holding facility, and by type of tenure arrangement

Type of holding facility	Own/free holding	Leasehold	Renting	Share-cropping	Squatting	Inheritance	Trusteeship	Other	Total
Total	107	26	10	1	2	0	1	2	149
Pond	79.4	69.2	30.0	100.0	100.0	0.0	100.0	100.0	75.2
Cage	10.3	23.1	70.0	0.0	0.0	0.0	0.0	0.0	16.1
Dam/Dug-out	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Reservoir	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Tank	4.7	3.8	0.0	0.0	0.0	0.0	0.0	0.0	4.0

12.5.3 Institutions in aquaculture and type of production

A total of 85 out of the 149 agricultural institutions engaged in aquaculture produce grow-out while an additional 30 produce both grow-out and hatchery. Among institutions producing grow-out, 75.3 percent use pond and 17.6 percent use cage. A similar pattern is observed for the other types of production except for hatchery, where the proportion using tank is relatively high (11.8%), see Table 12.12.

Table 12.12: Aquaculture institutions by type of holding facility, and by type of production establishment

Type of holding facility	Hatchery	Grow-out	Both	Total
Total	34	85	30	149
Pond	79.4	75.3	70.0	75.2
Cage	5.9	17.6	23.3	16.1
Dam/Dug-out	2.9	3.5	6.7	4.0
Reservoir	0.0	1.2	0.0	0.7
Tank	11.8	2.4	0.0	4.0

12.5.4 Aquaculture production, sale and cost of production

Four main types of aquatic organisms (tilapia, catfish, shrimp and heterotis) are cultured by agricultural institutions. A total of 39,095.5 mts of fish were produced in the reference year with tilapia constituting 66.8 percent. Catfish, which was the next most cultured fish, constituted 23.4 percent. All other fishes constituted less than 10 percent of quantity produced.

Tilapia is the main type of fish produced by institutions in urban areas. Tilapia was 94.5 percent of total quantity of fish produced in urban areas but in rural areas, the proportion of catfish was the highest (51.3%). Shrimps is only produced in the rural areas while heterotis is produced only in the urban areas. A similar pattern of quantity produced was observed for quantities sold.

With the exception of small-scale institutions where production was almost entirely tilapia (95.8%), production of tilapia by medium and large-scale institutions constituted 74.4 percent and 65.6 percent respectively. Production of catfish follows with about a quarter for medium and large-scale institutions. Shrimps were solely produced by large-scale institutions (8.1%), see Table 12.13.

Table 12.13: Quantity (mts) from aquaculture institutions by scale of production and type of aquaculture species, and by quantity produced, quantity sold, cost of production (GHC) and type of locality

Type of	Quantity produced				Quantity Sold				Cost of production			
species	Urban	Rural	Total	N	Urban	Rural	Total	N	Urban	Rural	Total	N
Total	21,989,150	17,106,300	39,095,450		18,278,500	16,004,500	34,283,000		33,892,910	98,783,780	132,676,690	
Tilapia	94.5	31.2	66.8	26,105,150	93.3	36.6	66.8	22,908,900	77.7	75.1	75.8	100,548,900
Catfish	1.8	51.3	23.4	9,167,300	6.2	50.9	27.1	9,283,800	12.2	14.8	14.1	18,702,990
Shrimp	0.0	17.5	7.7	3,000,000	0.0	12.5	5.8	2,000,000	0.0	10.1	7.5	10,000,000
Heterotis	3.7	0.0	2.1	822,000	0.5	0.0	0.3	89,300	10.1	0.0	2.6	3,418,800
Other	0.0	0.0	0.0	1,000	0.0	0.0	0.0	1,000	0.0	0.0	0.0	6,000
Small-scale farmers (produces between less than 50,000kg)												
Total	165,150	1,033,900	1,199,050		286,050	971,700	1,257,750		111,000	96,000	207,000	
Tilapia	76.2	98.9	95.8	1,148,750	87.9	94.4	93.0	1,169,150	100.0	93.8	97.1	201,000
Catfish	10.5	1.0	2.3	27,300	5.2	5.5	5.4	67,800	0.0	0.0	0.0	0
Shrimp	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0
Heterotis	13.3	0.0	1.8	22,000	6.9	0.0	1.6	19,800	0.0	0.0	0.0	0
Other	0.0	0.1	0.1	1,000	0.0	0.1	0.1	1,000	0.0	6.3	2.9	6,000
Medium-scale farmers (produces between more than 50,000kg but less than 100,000kg)												
Total	140,000	797,400	937,400		331,500	884,800	1,216,300		1,175,100	670,200	1,845,300	
Tilapia	42.9	79.9	74.4	697,400	57.3	93.9	83.9	1,020,800	92.2	100.0	95.0	1,753,700
Catfish	57.1	20.1	25.6	240,000	21.7	6.1	10.4	126,000	7.8	0.0	5.0	91,600
Shrimp	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0
Heterotis	0.0	0.0	0.0	0	21.0	0.0	5.7	69,500	0.0	0.0	0.0	0
Other	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0
Large-scale farmers (produces between more than 100,000kg)												
Total	21,684,000	15,275,000	36,959,000		17,660,950	14,148,000	31,808,950		32,606,810	98,017,580	130,624,390	
Tilapia	94.9	24.1	65.6	24,259,000	94.1	29.0	65.1	20,718,950	77.1	74.9	75.5	98,594,200
Catfish	1.4	56.3	24.1	8,900,000	5.9	56.9	28.6	9,090,000	12.4	14.9	14.2	18,611,390
Shrimp	0.0	19.6	8.1	3,000,000	0.0	14.1	6.3	2,000,000	0.0	10.2	7.7	10,000,000
Heterotis	3.7	0.0	2.2	800,000	0.0	0.0	0.0	0	10.5	0.0	2.6	3,418,800
Other	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0

Small = Small-scale farmers (producing less than 50,000kg)

Medium = Medium-scale farmers (producing between 50,000kg and 100,000kg)

Large = Large-scale farmers (producing more than 100,000kg)

About 95 percent of the total quantity of fish was produced in ponds by agricultural institutions and the others were produced in cages (3.4%), tanks (1.3%) and dams/dugout (0.6%). Hundred percent of all the various types of fish were produced in ponds, except for tilapia where 92.2 percent were produced in ponds, 5.0 percent produced in cage, 1.9 percent produced in tank and 0.9 percent produced in dam/dug-out.

The share of cost of production from the use of ponds is lower (63.0%) than its contribution to production (94.8%) and conversely, the proportion of cost of production from cages is higher (32.7%) than the share of production (3.4%), see Table 12.14.

Table 12.14: Quantity (mts) from aquaculture institutions by quantity produced, quantity sold, cost of production (GHC) and type of species, and by type of holding facility

	Type of holding facility					Total
	Pond	Cage	Dam/Dug-out	Reservoir	Tank	
Quantity of Species Cultured	37,059,200	1,310,200	225,000	2,000	499,050	
Total	94.8	3.4	0.6	0.0	1.3	39,095,450
Tilapia	92.2	5.0	0.9	0.0	1.9	26,105,150
Catfish	100.0	0.0	0.0	0.0	0.0	9,167,300
Shrimp	100.0	0.0	0.0	0.0	0.0	3,000,000
Heterotis	100.0	0.0	0.0	0.0	0.0	822,000
Other	100.0	0.0	0.0	0.0	0.0	1,000
Quantity of Species Sold	32,281,060	940,400	18,000	1,900	282,400	
Total	96.3	2.8	0.1	0.0	0.8	33,523,760
Tilapia	94.6	4.1	0.1	0.0	1.2	22,908,900
Catfish	100.0	0.0	0.0	0.0	0.0	8,524,560
Shrimp	100.0	0.0	0.0	0.0	0.0	2,000,000
Heterotis	100.0	0.0	0.0	0.0	0.0	89,300
Other	100.0	0.0	0.0	0.0	0.0	1,000
Total cost of production	83,604,690	43,338,960	436,000	82,000	5,215,040	
Total	63.0	32.7	0.3	0.1	3.9	132,676,690
Tilapia	51.2	43.1	0.4	0.1	5.2	100,548,900
Catfish	100.0	0.0	0.0	0.0	0.0	18,702,990
Shrimp	100.0	0.0	0.0	0.0	0.0	10,000,000
Heterotis	100.0	0.0	0.0	0.0	0.0	3,418,800
<u>Other</u>	<u>100.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>6,000</u>

The proportion of fish produced under mono-culture (58.4%) is higher than that of poly-culture (41.6%). All shrimps (100%) and 97.3 percent of heterotis are produced under the poly-culture system. While tilapia was mainly produced under mono-culture (81.4%), catfish was produced under the poly-culture system (82.7%), see Table 12.15.

Table 12.15: Quantity (mts) from aquaculture institutions by type of species, and by production system

Type of species cultured	Monoculture		Poly-culture		Total
	Number	%	Number	%	Number
Quantity of all types	22,847,300	58.4	16,248,150	41.6	39,095,450
Tilapia	21,260,000	81.4	4,845,150	18.6	26,105,150
Catfish	1,587,300	17.3	7,580,000	82.7	9,167,300
Shrimp	0	0.0	3,000,000	100.0	3,000,000
Heterotis	22,000	2.8	800,000	97.3	822,000
Other	0	0.0	1,000	100.0	1,000

12.6 Capture fisheries

12.6.1 Institutions in capture fisheries

A total of 96 institutions are engaged in capture fisheries of which 60.4 percent are into marine capture. There are 51 institutions in urban areas that are engaged in capture fisheries while 45 are in rural areas. Marine fishing by institutions is predominantly an urban activity (70.7%) while inland fishing is mostly undertaken in rural areas (73.7%), see Table 12.16.

Table 12.16: Capture fisheries institutions by type of capture fisheries, and by type of locality

Type of capture fisheries	<u>Urban</u>			<u>Rural</u>			<u>Total</u>	
	Number	%	Percent urban	Number	%	Percent rural	Number	%
Total	51	100	53.1	45	100	46.9	96	100
Marine	41	80.4	70.7	17	37.8	29.3	58	60.4
Inland	10	19.6	26.3	28	62.2	73.7	38	39.6

Approximately 91 percent of institutions use canoes for their fishing activities. Institutions that fish in inland waters use only canoe. Institutions that fish in marine waters use canoe (84.5%), semi-industrial vessels (12.1%) and in some instances, both canoe and semi-industrial vessels (3.4%) (Table 12.17).

Table 12.17: Capture fisheries institutions by type of vessels, and by type of capture fisheries

Type of vessel	Marine	%	Inland	%	Total	%
Total	58	100.0	38	100.0	96	100.0
Canoe	49	84.5	38	100.0	88	90.7
Semi-industrial	7	12.1	0	0.0	7	7.2
Both	2	3.4	0	0.0	2	2.1

12.6.2 Canoe ownership

Institutions engaged in capture fisheries have a total of 88 canoes, of which 56 are fully owned by the institutions, with an additional 11 jointly owned and another 11 on gratis (free use) basis. Fifty of the 88 canoes, representing about 57 percent are used for marine fishing (Table 12.18).

There are slightly more canoes in urban (52.3%) than rural areas (47.7%). Similarly, the number of jointly owned canoes in urban areas (8) is more than in rural areas (3) while the number of canoes in free use in rural areas (8) is more than in urban areas (3), see Table 12.18.

Table 12.18: Capture fisheries institutions by type of capture fisheries and type of ownership of canoe, and by type of locality

Canoe status/Type of Capture Fisheries	Type of locality				Total
	Urban	%	Rural	%	
Total					
Total	46	52.3	42	47.7	88
Fully owned	30	53.6	26	46.4	56
Free use	3	27.3	8	72.7	11
Jointly owned	8	72.7	3	27.3	11
Hired	5	50.0	5	50.0	10
Marine					
Total	35	70.0	15	30.0	50
Fully owned	21	70.0	9	30.0	30
Free use	3	75.0	1	25.0	4
Jointly owned	7	77.8	2	22.2	9
Hired	4	57.1	3	42.9	7
Inland					
Total	11	28.9	27	71.1	38
Fully owned	9	34.6	17	65.4	26
Free use	0	0.0	7	100.0	7
Jointly owned	1	50.0	1	50.0	2
Hired	1	33.3	2	66.7	3

12.6.3 Fishing gears used

Cast net (28.0%) and set net (27.1%) are the most used fishing gears by agricultural institutions which are into capture fisheries. The least used fishing gear is traps (2.5%). Set net is used by most institutions (37%) in inland fishing, while for marine fishing the most commonly used is cast net (39.1%), see Table 12.19.

Table 12.19: Capture fisheries institutions by type of fishing gear used, and by type of capture fisheries

Types of fishing gear	Marine		Inland		Total	
	Number	%	Number	%	Number	%
Total	64		54		118	
Purse seine (Poli/ Watsa)	4	6.3	1	1.9	5	4.2
Hook & Line	4	6.3	3	5.6	7	5.9
Drift Gill Net	3	4.7	4	7.4	7	5.9
Beach Seine	6	9.4	1	1.9	7	5.9
Ali	4	6.3	2	3.7	6	5.1
Set Net	12	18.8	20	37.0	32	27.1
Cast net	25	39.1	8	14.8	33	28.0
Atigya	0	0.0	7	13	7	5.9
Bamboo	0	0.0	5	9.3	5	4.2
Traps	1	1.6	2	3.7	3	2.5
Other	5	7.8	1	1.9	6	5.1

12.6.4 Production - Fish landings and sales

A total of 54,317 mts of fish was landed of which 34,478.8 mts, representing 63.5%, was landed from canoes. All inland fishing was by canoe and marine fishing was predominantly by semi-industrial fishing vessels (67.4%). An overwhelming quantity of fish (93.9%) from both canoe and semi-industrial fishing vessels was sold. Almost all inland fish landed (99.7%) and 89 percent of marine catch were sold (Table 12.20).

Table 12.20: Quantity (mts) from capture fisheries institutions by type of capture fisheries and type of vessel, and by quantity landed and quantity sold

Type of Vessel/ Type of fishing	Quantity in metric tonne (mts)			
	Caught / Landed		Sold	
	Number	%	Number	%
Total				
All	54,317.30	100.0	51,021.60	93.9
Canoe	34,478.80	63.5	33,481.10	97.1
Semi-industrial	19,838.50	36.5	17,540.50	88.4
Marine				
All	29,413.30	100.0	26,188.70	89.0
Canoe	9,574.80	32.5	8,648.20	90.3
Semi-industrial	19,838.50	67.4	17,540.50	88.4
In-land				
All	24,904.00	100.0	24,832.90	99.7
Canoe	24,904.00	100.0	24,832.90	99.7
Semi-industrial	-	-	-	-

12.6.5 Production - Fish species landed

While several species of fish were landed from marine, only four species were of substantial quantities—tuna (52.7%), anchovy (27.0%), barracuda (10.2%) and herring (7.6%). Tilapia catch dominated inland fishing (97.2%), see (Table 12.21).

Table 12.21: Quantity (mts) from capture fisheries institutions by type of capture fisheries and type of fish species, and by quantity landed and quantity sold*

Type of Fisheries caught and sold	Number Landed		Number Sold	
	Number	%	Number	%
Marine				
Total	29,413.3	100.0	26,188.7	89.0
Tuna	15,515.4	52.7	13,198.1	85.1
Anchovy	7,942.3	27.0	7,583.0	95.5
Barracuda	3,000.9	10.2	2,500.9	83.3
Herring	2,231.8	7.6	2,194.6	98.3
Mackerel (Salmon)	558.2	1.9	554.3	99.3
Sardinella	60.0	0.2	58.9	98.1
Dentex (Bala, Yeke, Tsile	53.0	0.2	53.0	100.0
Other	16.0	0.1	12.0	75.0
Crabs	15.2	0.1	14.8	97.4
Seabream (Sikasika)	14.0	0.0	13.8	98.2
Decapterus (Pamplo)	2.9	0.0	2.9	100.0
Red Pandora (Yiyiwa)	1.5	0.0	1.0	66.7
Butter Fish	1.0	0.0	0.5	51.6
Burrito	0.5	0.0	0.5	90.0
Shad/Bonga	0.4	0.0	0.4	100.0
Lobster	0.2	0.0	0.2	100.0
Inland				
Total	24,904.0	100.0	24,833.0	99.7
Tilapia	24,197.0	97.2	24,187.0	100.0
Sarotherodon galilaeus	523.0	2.1	484.0	92.6
Chrysichthys	108.0	0.4	106.0	98.0
Auchenoglanis	38.0	0.2	25.0	66.8
Clarias	15.0	0.1	11.0	73.0
Alestes	11.0	0.0	11.0	93.1
Heterotis	6.0	0.0	6.0	98.7
Polypterus spp	4.0	0.0	2.0	50.0
Cynothrissa	2.0	0.0	1.0	90.0
Hemichromis	0.0	0.0	0.0	0
Hydrocynus	0.0	0.0	0.0	0

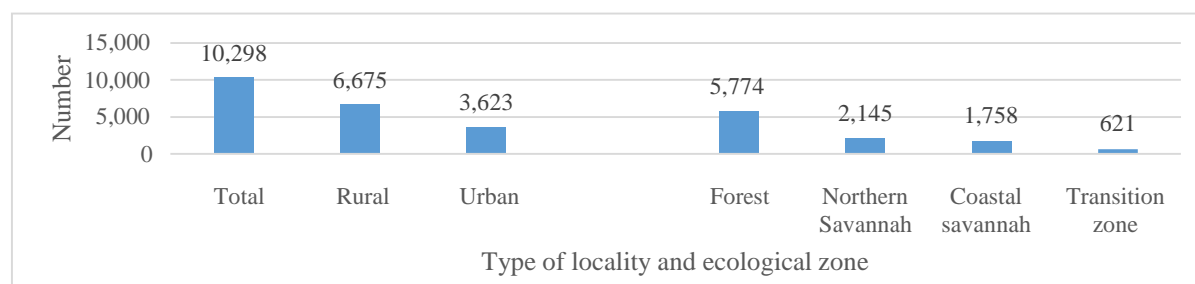
*Data on cost of production by institutions were not available because of difficulty in getting the appropriate respondents

12.7 Arable crops

12.7.1 Institutions cultivating arable crops

A total of 10,298 agricultural institutions are cultivating arable crops of which more than half (6,675) are in rural areas. Similarly, more than half of the institutions (5,774) are in the forest zone and one-fifth (2,145) are in the northern savannah zone (Figure 12.5).

Figure 12.5: Type of locality and agro-ecological zone of agricultural institutions



More than four-fifths of agricultural institutions which are into arable crops are cultivating starchy staples (81.9%) with similar proportions in urban and rural areas. More than two-thirds of institutions in all the ecological zones cultivate starchy staple crops with nine in ten institutions in the forest zone cultivating these crops. About 14 percent of institutions in the coastal savannah zone are cultivating non-leafy vegetables. Agricultural institutions cultivating pulses/legumes are mainly in the northern savannah (23.5%) and the transitional zones (10.5%), see Table 12.22.

Table 12.22: Arable crop institutions by type of arable crop, and by type of locality and agro-ecological zone

Type of crop*	Type of locality			Ecological zone				Total	Total
	Urban	Rural	Total	Coastal savannah	Forest	Transitional zone	Northern savannah		
Number of institutions	6,088	11,453	17,541	2,683	10,562	969	3,327	17,541	
Starchy staple crops	80.4	82.7	81.9	70.7	89.2	77.4	69.0	81.9	14,362.0
Pulse/legume crops	4.4	7.4	6.4	3.1	1.5	10.5	23.5	6.4	1,120.0
Herbs/spices/condiment	3.5	3.2	3.3	7.9	2.6	4.0	1.7	3.3	576.0
Horticultural crops	0.9	1.1	1.1	3.1	0.9	0.5	0.1	1.1	186.0
Leafy vegetable crops	0.4	0.2	0.3	0.6	0.2	0.1	0.5	0.3	49.0
Non-vegetable crops	9.7	5.1	6.7	13.9	5.3	7.3	5.1	6.7	1,177.0
Industrial crops	0.6	0.3	0.4	0.9	0.4	0.1	0.2	0.4	71.0

* Institution may have more than one holding and may be engaged in multiple cropping

More than four-fifths of agricultural institutions engaged in starchy staple crops are cultivating three major crops: maize (40.1%), cassava (25.2%) and plantain (20.7%). A similar pattern is observed among institutions in the coastal and forest zones. In the transitional zone, institutions are engaged in three major crops namely maize (57.2%), yam (17.1%) and cassava (17.1%) while in the northern savannah zone, the crops are maize (60.3%), millet (11.7%) and rice (9.8%).

For institutions engaged in pulses/legumes, the three major crops are groundnuts (50.2%), cowpea (21.8%) and soya beans (17.1%). In the case of herbs/spices, institutions are engaged mainly in two crops namely, hot pepper (85.1%) and ginger (12.2%), see Table 12.23.

Table 12.23: Arable crop institutions by type of arable crop and type of crop, and by agro-ecological zone

Type of arable crop*	Ecological zone								Total	
	Coastal savannah		Forest		Transitional zone		Northern sava mah			
	Number	%	Number	%	Number	%	Number	%	Number	%
Starchy staple crops	1,897	100.0	9,420	100.0	750	100.0	2,295	100.0	14,362	100.0
Maize	858	45.2	3,089	32.8	429	57.2	1,383	60.3	5,759	40.1
Rice	35	1.8	155	1.6	13	1.7	224	9.8	427	3.0
Millet	3	0.2	2	0.0	3	0.4	269	11.7	277	1.9
Sorghum	2	0.1	2	0.0	1	0.1	107	4.7	112	0.8
Cassava	564	29.7	2,813	29.9	128	17.1	108	4.7	3,613	25.2
Yam	28	1.5	202	2.1	128	17.1	196	8.5	554	3.9
Cocoyam	28	1.5	575	6.1	5	0.7	1	0.0	609	4.2
Taro	1	0.1	2	0.0	0	0.0	0	0.0	3	0.0
Sweet Potato	20	1.1	16	0.2	1	0.1	4	0.2	41	0.3
Plantain	358	18.9	2,564	27.2	42	5.6	3	0.1	2,967	20.7
Pulse/legume crops	82	100.0	154	100.0	102	100.0	782	100.0	1,120	100.0
Bambara beans	7	8.5	13	8.4	18	17.6	81	10.4	119	10.6
Cowpeas	38	46.3	48	31.2	55	53.9	103	13.2	244	21.8
Groundnuts	31	37.8	84	54.5	24	23.5	423	54.1	562	50.2
Pigeon peas	0	0.0	2	1.3	1	1.0	1	0.1	4	0.4
Soya bean	6	7.3	7	4.5	4	3.9	174	22.3	191	17.1
Herbs/spices/condiment	211	100.0	270	100.0	39	100.0	56	100.0	576	100.0
Black pepper	3	1.4	3	1.1	0	0.0	5	8.9	11	1.9
Ginger	4	1.9	63	23.3	2	5.1	1	1.8	70	12.2
Pepper (Hot)	203	96.2	203	75.2	35	89.7	49	87.5	490	85.1
Melon Seeds(Agusi)	1	0.5	1	0.4	2	5.1	1	1.8	5	0.9
Horticultural crops	83	100.0	96	100.0	5	100.0	2	100.0	186	100.0
Flowers	1	1.2	1	1.0	0	0.0	0	0.0	2	1.1
Pineapples	57	68.7	78	81.3	1	20.0	0	0.0	136	73.1
Watermelon	21	25.3	13	13.5	4	80.0	2	100.0	40	21.5
Passion Fruit	2	2.4	2	2.1	0	0.0	0	0.0	4	2.2
sweetsop	1	1.2	0	0.0	0	0.0	0	0.0	1	0.5
soursop	1	1.2	0	0.0	0	0.0	0	0.0	1	0.5
Butternut squash	0	0.0	2	2.1	0	0.0	0	0.0	2	1.1
Leafy vegetable crops	15	100.0	17	100.0	1	100.0	16	100.0	49	100.0
Gboma	1	6.7	7	41.2	0	0.0	0	0.0	8	16.3
Bitter leaf	1	6.7	0	0.0	0	0.0	0	0.0	1	2.0
Amaranthus	0	0.0	0	0.0	0	0.0	1	6.3	1	2.0
Spinach	1	6.7	1	5.9	0	0.0	0	0.0	2	4.1
Pumpkin leaves	0	0.0	0	0.0	0	0.0	5	31.3	5	10.2
Moringa	4	26.7	1	5.9	1	100.0	2	12.5	8	16.3
Ayoyo/ Ademe	2	13.3	4	23.5	0	0.0	2	12.5	8	16.3
other leafy vegetables	6	40.0	4	23.5	0	0.0	6	37.5	16	32.7
Non-leafy vegetable crops	372	100.0	564	100.0	71	100.0	170	100.0	1,177	100.0
Asian vegetables	3	0.8	1	0.2	0	0.0	0	0.0	4	0.3
Cabbage	32	8.6	58	10.3	7	9.9	10	5.9	107	9.1
Carrots	13	3.5	25	4.4	2	2.8	5	2.9	45	3.8
Garden eggs	40	10.8	96	17.0	9	12.7	8	4.7	153	13.0
Lettuce	8	2.2	20	3.5	4	5.6	1	0.6	33	2.8
Stringed Beans	8	2.2	11	2.0	3	4.2	7	4.1	29	2.5
Okra	85	22.8	147	26.1	10	14.1	65	38.2	307	26.1
Pepper (Sweet)	17	4.6	33	5.9	11	15.5	11	6.5	72	6.1
Cucumber	10	2.7	14	2.5	2	2.8	0	0.0	26	2.2
Spring Onions	1	0.3	1	0.2	0	0.0	0	0.0	2	0.2
Tomato	118	31.7	148	26.2	20	28.2	42	24.7	328	27.9
Onions	34	9.1	10	1.8	3	4.2	21	12.4	68	5.8
Shallots	3	0.8	0	0.0	0	0.0	0	0.0	3	0.3
Industrial crops	23	100.0	41	100.0	1	100.0	6	100.0	71	100.0
Kenaf	0	0.0	1	2.4	0	0.0	0	0.0	1	1.4
Sissal	0	0.0	0	0.0	0	0.0	2	33.3	2	2.8
Sugar Cane	8	34.8	16	39.0	0	0.0	0	0.0	24	33.8
Tobacco	0	0.0	2	4.9	0	0.0	1	16.7	3	4.2
Ornamental	15	65.2	22	53.7	1	100.0	3	50.0	41	57.7

* Institution may have more than one holding and may be engaged in multiple cropping

12.7.2 Cropping systems used by institutions for arable crops

More than half of the institutions cultivate arable crops under mono-cropping system except for starchy staples and leafy vegetables, where the proportion using mono-cropping system is less than 50 percent. For urban areas, the proportions of institutions cultivating starchy staples (48.8%), leafy vegetables (46.4%) and non-leafy vegetables (49.8%) under mono-cropping system are less than 50 percent while for rural areas, it is only in the cultivation of starchy staples that the proportion of institutions is less than 50 percent (Table 12.24).

Table 12.24: Arable crop institutions by type of arable crop, and by type of locality and type of cropping system

Type of crop	Urban			Rural			Total		
	Mono-cropping	Mixed-cropping	Total	Mono-cropping	Mixed-cropping	Total	Mono-cropping	Mixed-cropping	Total
Total	3,037	3,050	6,087	5,380	6,074	11,454	8,417	9,124	17,541
Starchy staples	48.8	51.2	4,893	44.5	55.5	9,469	46	54	14,362
Pulses / legumes	61.1	38.9	270	60.7	39.3	850	60.9	39.1	1,120
Herbs spices /condiments	55.5	44.5	218	60.3	39.7	368	58.9	41.1	586
Horticulture	77.2	22.8	57	72.1	27.9	129	72.6	27.4	186
Leafy vegetables	46.4	53.6	28	53.8	46.2	26	46.3	53.7	54
Non-leafy vegetables	49.8	50.2	592	50.8	49.2	585	50	50	1,177
Industrial crops	41.4	58.6	29	77.8	22.2	27	60.7	39.3	56

12.7.3 Land tenure arrangements of institutions

Generally, more than half of the institutions (62.0%) own the parcels used in cultivating all types of arable crops through freehold, with a higher proportion (81.5%) among institutions engaged in leafy vegetables. Additionally, 10.8 percent also own their parcels through inheritance with a higher proportion among institutions engaged in pulses/legumes (17.5%).

Renting is the next common land tenure arrangement for the cultivation of arable crops, accounting for 10.8 percent of institutions. The proportion of institutions renting their parcels is higher among those who are cultivating non-leafy vegetables (17.9%), horticultural crops (15.1%) and herbs/spices and condiments (14.2%)

Share-cropping (3.6%) and trusteeship (2.9%) are not common land tenure arrangements among agricultural institutions engaged in the cultivation of arable crops. A similar pattern is observed for institutions in urban areas who own by either freehold or inheritance (Table 12.25).

Table 12.25: Arable crop institutions by type of locality and type of arable crop, and by type of land tenure arrangement

Type of crop/locality	Own/ free-holding		Inheritance		Lease-hold		Renting		Share-cropping		Squatting		Trustee-ship		Other		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Total	10,881	62.0	1,893	10.8	1,214	6.9	1,886	10.8	626	3.6	412	2.3	512	2.9	112	0.6	17,536	100.0
Starchy staples	9,001	62.7	1,544	10.8	961	6.7	1,454	10.1	573	4.0	340	2.4	407	2.8	78	0.5	14,358	100
Pulses and legumes	646	57.7	196	17.5	77	6.9	105	9.4	16	1.4	25	2.2	47	4.2	8	0.7	1,120	100
Herbs, spices and condiments	347	59.2	48	8.2	50	8.5	83	14.2	11	1.9	17	2.9	19	3.2	11	1.9	586	100
Horticulture	95	51.4	7	3.8	42	22.7	28	15.1	1	0.5	2	1.1	8	4.3	2	1.1	185	100
Leafy vegetables	44	81.5	2	3.7	4	7.4	2	3.7	0	0.0	2	3.7	0	0.0	0	0.0	54	100
Non-leafy vegetables	712	60.5	94	8.0	71	6.0	211	17.9	25	2.1	25	2.1	28	2.4	11	0.9	1,177	100
Industrial crops	36	64.3	2	3.6	9	16.1	3	5.4	0	0.0	1	1.8	3	5.4	2	3.6	56	100.0
Urban																		
Total	3,764	61.9	588	9.7	373	6.1	797	13.1	200	3.3	165	2.7	172	2.8	24	0.4	6,083	100.0
Starchy staples	3,042	62.2	502	10.3	291	6.0	589	12.0	179	3.7	141	2.9	133	2.7	12	0.2	4,889	100
Pulses and legumes	157	58.1	30	11.1	13	4.8	49	18.1	5	1.9	2	0.7	13	4.8	1	0.4	270	100
Herbs, spices and condiments	122	56.0	17	7.8	19	8.7	40	18.3	3	1.4	6	2.8	6	2.8	5	2.3	218	100
Horticulture	35	61.4	3	5.3	4	7.0	10	17.5	0	0.0	1	1.8	4	7.0	0	0.0	57	100
Leafy vegetables	24	85.7	0	0.0	3	10.7	0	0.0	0	0.0	1	3.6	0	0.0	0	0.0	28	100
Non-leafy vegetables	367	62.0	36	6.1	39	6.6	107	18.1	13	2.2	13	2.2	13	2.2	4	0.7	592	100
Industrial crops	17	58.6	0	0.0	4	13.8	2	6.9	0	0.0	1	3.4	3	10.3	2	6.9	29	100.0
Rural																		
Total	7,117	62.1	1,305	11.4	841	7.3	1,089	9.5	426	3.7	247	2.2	340	3.0	88	0.8	11,453	100.0
Starchy staples	5,959	62.9	1,042	11.0	670	7.1	865	9.1	394	4.2	199	2.1	274	2.9	66	0.7	9,469	100
Pulses and legumes	489	57.5	166	19.5	64	7.5	56	6.6	11	1.3	23	2.7	34	4.0	7	0.8	850	100
Herbs, spices and condiments	225	61.1	31	8.4	31	8.4	43	11.7	8	2.2	11	3.0	13	3.5	6	1.6	368	100
Horticulture	60	46.9	4	3.1	38	29.7	18	14.1	1	0.8	1	0.8	4	3.1	2	1.6	128	100
Leafy vegetables	20	76.9	2	7.7	1	3.8	2	7.7	0	0.0	1	3.8	0	0.0	0	0.0	26	100
Non-leafy vegetables	345	59.0	58	9.9	32	5.5	104	17.8	12	2.1	12	2.1	15	2.6	7	1.2	585	100
Industrial crops	19	70.4	2	7.4	5	18.5	1	3.7	0	0.0	0	0.0	0	0.0	0	0.0	27	100.0

12.7.4 Size of land parcels of agricultural institutions

Overall, 85.2 percent of agricultural institutions engaged in arable crop cultivation have land sizes less than 5 acres, with majority (54.5%) using less than 2 acres of land. Only 6.1 percent of parcels are 10 acres or larger. More than half (54.3%) of the land parcels used by institutions in the cultivation of starchy staples are less than 2 acres with higher proportion of land parcels which is less than 2 acres being used by institutions in the cultivation of leafy vegetables (86.0%), non-leafy vegetables (66.9%), industrial crops (65.5%) and herbs/spices (63.7%). More than one-fifth of the land parcels used by institutions in the cultivation of horticultural crops are 10 acres or larger.

Similar patterns of the proportion of land parcels that are less than 2 acres are observed under both mono-cropping and mixed-cropping systems except for starchy staples under mono-cropping where the proportion (49.4 percent) of land parcels is less than 2 acres. The pattern of land parcels for all cropping systems that are 10 acres or larger is similar for mixed-cropping while for mono-cropping, the proportion of land parcels that are 10 acres or larger used for the cultivation of leafy vegetables is higher (Table 12.26).

Table 12.26: Land parcels of arable crop institutions by type of cropping system and type of arable crop, and by size (acres) of parcel

Size of plot/parcel	<2	2 = <5	5 = <10	10+	Total
All	12,783	3,420	1,163	708	18,074
Total	54.5	30.7	8.7	6.1	
Starchy staples	54.3	31.0	8.8	5.9	14,824
Pulses and legumes	40.5	41.2	10.5	7.7	1,138
Herbs, spices and condiments	63.7	24.7	7.5	4.0	598
Horticulture	39.0	26.8	10.2	23.9	205
Leafy vegetables	86.0	4.0	6.0	4.0	50
Non-leafy vegetables	66.9	22.6	5.6	4.9	1,201
Industrial crops	65.5	19.0	3.4	12.1	58
Mono-cropping					
Total	50.2	31.1	10.4	8.4	8,708
Starchy staples	49.4	31.0	11.0	8.6	6,856
Pulses and legumes	41.5	40.8	9.6	8.0	698
Herbs, spices and condiments	61.1	26.5	8.4	4.0	347
Horticulture	41.4	26.2	9.0	23.4	145
Leafy vegetables	75.0	5.0	10.0	10.0	20
Non-leafy vegetables	62.8	26.6	5.6	5.0	605
Industrial crops	62.2	21.6	5.4	10.8	37
Mixed-cropping					
Total	58.5	30.4	7.1	4.0	9,366
Starchy staples	58.4	31.0	6.9	3.6	7,968
Pulses and legumes	38.9	41.8	12.0	7.3	440
Herbs, spices and condiments	67.3	22.3	6.4	4.0	251
Horticulture	33.3	28.3	13.3	25.0	60
Leafy vegetables	93.3	3.3	3.3	0.0	30
Non-leafy vegetables	71.0	18.6	5.5	4.9	596
Industrial crops	71.4	14.3	0.0	14.3	21

12.7.5 Use of selected inputs in arable crop cultivation by institutions

Majority of agricultural institutions cultivating arable crops do not use fertilizer. A total of 12,370 representing more than two-thirds (68.4%) of these institutions do not use fertilizer. Higher proportions of institutions cultivating leafy vegetables (82.0%), pulses/legumes (77.3%), industrial crops (72.4%) and starchy staples (71.2%) do not use fertilizer. However, more than half of institutions cultivating herbs/spices (52.7%) and non-leafy vegetables (57.9%) use fertilizer.

Only few institutions (10.9%) use irrigation in the cultivation of arable crops. Institutions cultivating non-leafy vegetables (45.6%), horticultural crops (35.6%) and leafy vegetables (34.0%) are the highest users of irrigation. Similarly, only 2.9 percent of institutions engaged in the cultivation of arable crops use protective cover in cultivating crops.

The input mostly used by agricultural institutions is pesticide. A total of 12,692 institutions, representing 70.2 percent of the total institutions involved in the cultivation of arable crops, use pesticide. Institutions cultivating horticultural crops (83.9%), non-leafy vegetables (75.4%) herbs/spices (75.1%) and starchy staples (70.2%) constitute the highest proportions that use pesticide (Table 12.27).

Table 12.27: Arable crop institutions by type of arable crops, and by use of fertilizer, pesticide, irrigation and protective cover

Type of arable crops	Use of fertilizer			Use of pesticide			Use of irrigation			Use of protective cover		
	Did not use		Total	Did not use		Total	Did not use		Total	Did not use		Total
	Used			Used			Used			Used		
All types of crops	5,704	12,370	18,074	12,692	5,382	18,074	1,970	16,104	18,074	517	17,557	18,074
Starchy staples	28.8	71.2	14,824	70.2	29.8	14,824	7.5	92.5	14,824	2.3	97.7	14,824
Pulses/legumes	22.7	77.3	1,138	62	38	1,138	5.4	94.6	1,138	1.4	98.6	1,138
Herbs/spices	52.7	47.3	598	75.1	24.9	598	23.6	76.4	598	4.8	95.2	598
Horticulture	72.2	27.8	205	83.9	16.1	205	35.6	64.4	205	11.2	88.8	205
Leafy vegetables	18	82	50	32	68	50	34	66	50	6	94	50
Non-leafy vegetables	57.9	42.1	1,201	75.4	24.6	1,201	45.6	54.4	1,201	8.8	91.2	1,201
Industrial crops	27.6	72.4	58	58.6	41.4	58	19	81	58	5.2	94.8	58

12.7.6 Agro-ecological zones of institutions engaged in arable crop cultivation

More than 60 percent of the agricultural institutions engaged in the cultivation of arable crops are located in the forest zone and 3,421 institutions, representing 18.9 percent, are in the transitional zone.

The number of institutions in rural areas of each zone are more than urban areas with the exception of the coastal savannah where there are more institutions in the urban areas than in the rural (Table 12.28).

Table 12.28: Arable crop institutions by type of arable crop, and by agro-ecological zone and type of locality

Type of arable crops	Coastal Savannah			Forest			Transitional Zone			Northern Savannah		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All types of crops	1,477	1,298	2,775	3,698	7,185	10,883	669	2,752	3,421	436	559	995
	100.0	100	100	100	100	100	100	100	100	100	100	100
Starchy staples	69.7	71.9	70.7	87.6	90.2	89.3	71.2	68.9	69.4	72.5	81.6	77.6
Pulses/legumes	2.2	3.9	3.0	1.4	1.5	1.4	17.9	24.6	23.3	15.8	6.1	10.4
Herbs/spices	6.6	9.5	7.9	2.7	2.5	2.6	1.5	1.7	1.6	3.2	4.7	4
Horticulture	2.4	4.5	3.4	0.6	1.1	0.9	0.1	0	0.1	0.9	0.5	0.7
Leafy vegetables	0.9	0.1	0.5	0.2	0.1	0.2	0.6	0.4	0.5	0	0.2	0.1
Non-leafy vegetables	17.3	9.9	13.9	7.1	4.3	5.3	8.4	4.2	5	7.6	6.8	7.1
Industrial crops	0.8	0.2	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0	0.2	0.1

12.7.7 Purpose of institutions cultivating arable crops

The main purpose of agricultural institutions cultivating arable crops is sales. A total of 11,418 institutions, representing 63.2 percent, are cultivating arable crops for sales only, and 17.9 percent cultivate arable crops for sales with minor consumption. A similar pattern is observed for institutions in urban and rural areas (Table 12.29)

Table 12.29: Arable crop institutions by type of arable crop, and by purpose for production

Type of arable crops	Own consumption only			Own consumption with minor sales			Sales only			Sales with minor consumption		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All types of crops	930	1,553	2,483	286	658	944	3,815	7,603	11,418	1,249	1,980	3,229
Starchy staples	73.1	74.4	73.9	74.1	66	68.4	88.2	90.3	89.6	64.5	66.1	65.4
Pulses/legumes	4.5	13.9	10.4	8.7	21.1	17.4	1.9	3.2	2.8	10.5	13.4	12.3
Herbs/spices	6.7	4.2	5.1	5.9	5.8	5.8	1.8	1.7	1.7	5.9	7.4	6.8
Horticulture	0.4	0.6	0.5	1.4	1.5	1.5	0.6	0.8	0.7	2.8	3	2.9
Leafy vegetables	1.7	0.5	0.9	0.3	0.8	0.6	0.1	0.1	0.1	0.5	0.4	0.4
Non-leafy vegetables	12.4	6.1	8.5	8.7	4.7	5.9	7.2	3.7	4.9	15.5	9.2	11.6
Industrial crops	1.2	0.3	0.6	0.7	0.2	0.3	0.3	0.2	0.2	0.4	0.4	0.4

12.7.8 Production, sale and cost of production of arable crops

Agricultural institutions produced a total of 1,954,265 metric tonnes of arable crops of which 1,360,756 representing 69.6 percent were in rural areas. The types of arable crops produced by institutions were mainly, horticultural crops (49.5%), starchy staples (35.2%) and herbs/spices (13.8%) and these together constituted 98.5 percent of total quantity produced. In urban areas, the dominant crops produced by institutions were starchy staples (50.7%) and herbs/spices (45.2%) while in rural areas horticultural crops (70.5%) and starchy staples (28.4%) were the dominant crops.

Starchy staples (92.9%) were the main type of crops produced by institutions on small-scale in both urban (89.6%) and rural (95.0%) areas. Similarly, among institutions which produced on medium-scale, starchy staples constituted 94.5 percent of their total production. Three types of arable crops were the main focus of institutions that produced on large-scale: horticultural crops (58.1%), starchy staples (24.8%) and herbs/spices (16.1%), all together constituted 99.0 percent. A similar pattern is observed for quantities sold. However, more than half (51.3%) of the total quantity sold were horticultural crops (Table 12.30).

Table 12.30: Quantity (mts) from arable crop institutions by scale of production and type of arable crop, and by quantity produced, quantity sold, cost of production (GHC) and type of locality

Crops/holder type	Quantity produced (tonnes)				Quantity Sold (tonnes)				Cost of production ('000 GHC)			
	Urban	Rural	Total	Number	Urban	Rural	Total	Number	Urban	Rural	Total	Number
All Farms												
Total	593,509	1,360,756	1,954,265	1,954,265	574,150	1,309,374	1,883,524	1,883,524	12,549	21,342	33,891	33,891
Starchy staples	50.7	28.4	35.2	687,049	49.2	25.7	32.8	618,570	79.5	62.7	68.9	23,351
Pulses /legumes	0.2	0.1	0.1	2,880	0.2	0.1	0.1	2,719	8.3	2.4	4.6	1,544
Herbs/spices/condiments	45.2	0.1	13.8	269,577	46.8	0.1	14.3	269,194	1.8	2.0	1.9	640
Horticulture	1.3	70.5	49.5	966,639	1.2	73.2	51.3	965,462	2.5	22.4	15.0	5,090
Leafy vegetables	0.0	0.0	0.0	313	0.0	0.0	0.0	306	0.3	0.1	0.2	57
Non-leafy vegetables	2.4	0.5	1.1	20,832	2.5	0.5	1.1	20,659	7.3	5.8	6.4	2,162
Industrial crops	0.1	0.5	0.4	6,975	0.1	0.5	0.4	6,613	0.4	4.7	3.1	1,046
Small-scale farmers (farmed less than or equal to 2 acres)												
Total	61,294	96,122	157,416	157,416	54,083	87,762	141,844	141,844	2,954	4,419	7,372	7,372
Starchy staples	89.6	95.0	92.9	146,224	88.4	94.7	92.3	130,954	71.7	74.4	73.3	5,405
Pulses /legumes	0.3	0.7	0.6	879	0.3	0.7	0.6	835	2.8	5.0	4.1	302
Herbs/spices/condiments	0.4	0.3	0.4	554	0.4	0.3	0.4	527	4.8	4.6	4.7	346
Horticulture	0.4	0.9	0.7	1,050	0.3	0.9	0.7	950	1.2	1.9	1.6	121
Leafy vegetables	0.1	0.0	0.0	35	0.0	0.0	0.0	28	0.9	0.1	0.4	32
Non-leafy vegetables	9.2	3.0	5.4	8,541	10.3	3.2	5.9	8,430	18.0	13.6	15.4	1,133
Industrial crops	0.2	0.0	0.1	134	0.2	0.0	0.1	121	0.7	0.3	0.4	33
Medium-scale farmers (farmed more than 2 but less than or equal to 5 acres)												
Total	38,211	98,460	136,671	136,671	32,440	84,177	116,617	116,617	1,544	2,263	3,808	3,808
Starchy staples	86.2	97.8	94.5	129,192	84.9	97.9	94.3	109,919	71.8	76.8	74.8	2,848
Pulses /legumes	0.3	0.3	0.3	398	0.3	0.3	0.3	357	4.8	5.8	5.4	206
Herbs/spices/condiments	2.0	0.6	1.0	1,322	2.4	0.3	0.9	992	1.2	5.4	3.7	140
Horticulture	1.6	0.9	1.1	1,502	1.9	1.0	1.3	1,469	8.6	4.5	6.2	234
Leafy vegetables	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0
Non-leafy vegetables	8.4	0.3	2.6	3,551	9.8	0.4	3.0	3,518	13.6	5.5	8.8	335
Industrial crops	1.5	0.1	0.5	706	0.7	0.2	0.3	361	0.0	2.0	1.2	45
Large-scale farmers (farmed more than 5 acres)												
Total	494,004	1,166,174	1,660,178	1,660,178	487,628	1,137,435	1,625,063	1,625,063	8,052	14,660	22,711	22,711
Starchy staples	43.1	17.0	24.8	411,633	42.5	15.0	23.2	377,697	83.9	56.9	66.5	15,099
Pulses /legumes	0.2	0.1	0.1	1,603	0.2	0.1	0.1	1,527	10.9	1.1	4.6	1,037
Herbs/spices/condiments	54.2	0.0	16.1	267,701	54.9	0.0	16.5	267,675	0.8	0.6	0.7	154
Horticulture	1.4	82.1	58.1	964,088	1.3	84.1	59.3	963,043	1.8	31.3	20.8	4,735
Leafy vegetables	0.0	0.0	0.0	278	0.0	0.0	0.0	278	0.1	0.1	0.1	24
Non-leafy vegetables	1.1	0.3	0.5	8,740	1.1	0.3	0.5	8,711	2.2	3.5	3.1	695
Industrial crops	0.0	0.5	0.4	6,135	0.0	0.5	0.4	6,131	0.4	6.4	4.3	968

12.8 Tree crops

12.8.1 Institutions cultivating tree crops and type of cropping

A total of 5,019 agricultural institutions are engaged in the cultivation of tree crops with cocoa representing a dominant share of 3,254 (64.8%), followed by oil-palm 718 (14.3%) and cashew 693 (13.8%). About 60 percent of institutions cultivating tree crops are in rural areas with higher proportions among those cultivating shea nut (77.8%), coffee (66.7%), banana (65.0%), pawpaw (61.1%) and cocoa (60.3%). About two-thirds of institutions cultivating cola (66.7%) are in urban areas. Almost all institutions engaged in tree cropping (96.9%) are using mono-cropping system. Similar patterns are observed for institutions using the mono-cropping system in both urban and rural areas (Table 12.31).

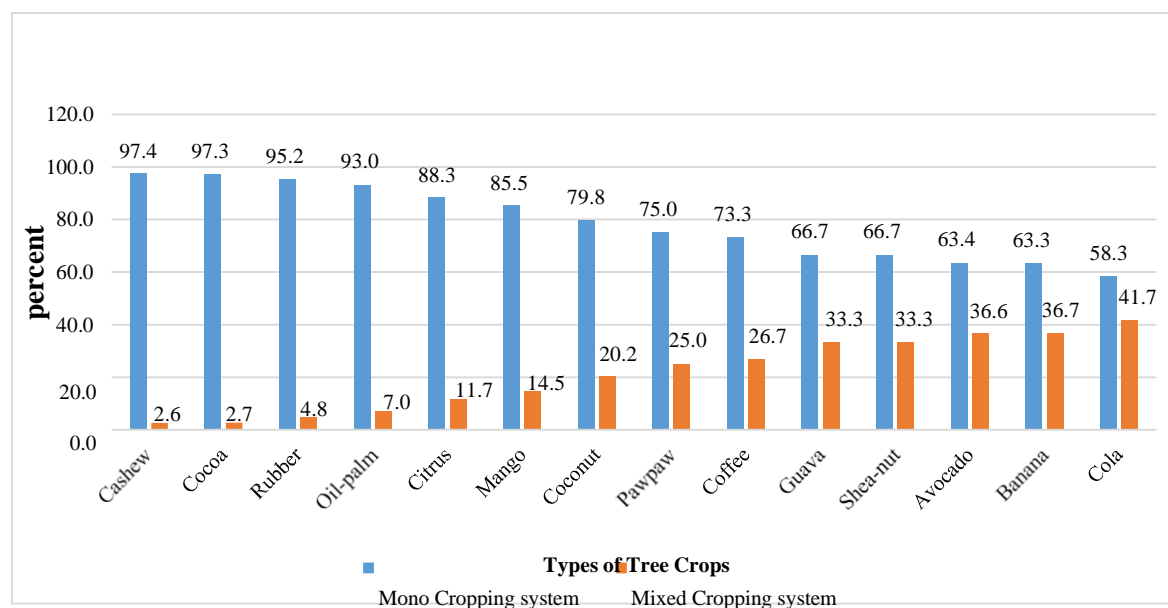
Table 12.31: Tree crop institutions by type of crop, and by type of cropping system and type of locality

Type of Tree crops	Mono-cropping			Mixed-cropping				Total				
	Urban	Rural	Total	Total	Urban	Rural	Total	Total	Urban	Rural	Total	Total
All												
institutions	1,946	2,917	4,863	4,863	82	74	156	156	2,028	2,991	5,019	5,019
% of cropping system												
Total	96.0	97.5	96.9		4.0	2.5	3.1		40.4	59.6	100.0	
Avocado	77.8	52.2	63.4	26	22.2	47.8	36.6	15	43.9	56.1	100.0	41
Banana	61.9	64.1	63.3	38	38.1	35.9	36.7	22	35.0	65.0	100.0	60
Cashew	97.1	97.6	97.4	675	2.9	2.4	2.6	18	40.3	59.7	100.0	693
Cocoa	96.8	97.6	97.3	3,166	3.2	2.4	2.7	88	39.7	60.3	100.0	3,254
Coconut	73.4	85.7	79.8	130	26.6	14.3	20.2	33	48.5	51.5	100.0	163
Coffee	60.0	80.0	73.3	11	40.0	20.0	26.7	4	33.3	66.7	100.0	15
Cola	50.0	75.0	58.3	7	50.0	25.0	41.7	5	66.7	33.3	100.0	12
Citrus	84.9	90.9	88.3	256	15.1	9.1	11.7	34	43.4	56.6	100.0	290
Mango	79.1	90.3	85.5	218	20.9	9.7	14.5	37	43.1	56.9	100.0	255
Oil-palm	89.8	96.0	93.0	668	10.2	4.0	7.0	50	47.8	52.2	100.0	718
Guava	66.7	66.7	66.7	4	33.3	33.3	33.3	2	50.0	50.0	100.0	6
Pawpaw	57.1	86.4	75.0	27	42.9	13.6	25.0	9	38.9	61.1	100.0	36
Shea nut	50.0	71.4	66.7	6	50.0	28.6	33.3	3	22.2	77.8	100.0	9
Rubber	95.2	95.2	95.2	40	4.8	4.8	4.8	2	50.0	50.0	100.0	42

12.8.2 Type of tree crops and cropping system

More than half of institutions cultivating any tree crop use the mono-cropping system with higher proportions of more than nine in ten institutions cultivating avocado (97.4%), banana (97.3%), cashew (95.2%) and cocoa (93.0%). The types of tree crops for which mixed-cropping system is common are cola (41.7%), banana (36.7%), avocado (36.6%) and shea nut (33.3%) where at least one-third of institutions use this type of cropping system, (Figure 12.6).

Figure 12.6: Type of tree crop of agricultural institutions by type of cropping system (percent)



12.8.3 Land tenure arrangements of agricultural institutions

Of the total parcels used by institutions for the cultivation of tree crops, 80.9 percent are owned either through freehold (67.4%) or through inheritance (13.5%) followed by share-cropping 8.5 percent and leasing 6.5 percent. Whereas the pattern holds for shea nut, banana, cocoa, cashew and citrus, in the case of avocado, coconut, mango, guava, pawpaw and rubber, leasehold is the second most practiced tenure arrangement. For oil-palm and coffee, share-cropping and trusteeship are respectively the second form of tenure arrangement. Although the practice of squatting features little in the cultivation of all tree crops (8 out of 14 tree crop cultivation do not involve any squatting arrangement), at least 1 percent of the land under squatting arrangement is used for the cultivation of banana and coconut (Table 12.32).

Table 12.32: Land parcels of tree crop institutions by type of crop, and by type of land tenure arrangement

Tree crop	Own/ Free holding	Inheritance	Leasehold	Renting	Share-cropping	Squatting	Trusteeship	Other	Total
All parcels	67.4	13.5	6.5	2.3	8.5	0.3	1.1	0.4	5,684
Avocado	83.3	2.4	9.5	2.4	2.4	0.0	0.0	0.0	42
Banana	49.2	23.9	17.9	3.0	1.5	1.5	3.0	0.0	67
Cashew	76.5	9.7	7.5	2.7	2.7	0.0	0.1	0.8	710
Cocoa	65.1	16.2	4.8	1.8	10.2	0.4	1.3	0.2	3,559
Coconut	70.6	6.6	9.6	5.4	4.2	1.2	0.0	2.4	166
Coffee	66.6	6.7	6.7	6.7	0.0	0.0	13.3	0.0	15
Cola	76.9	7.7	0.0	7.7	7.7	0.0	0.0	0.0	13
Citrus	74.3	8.2	6.9	3.0	6.3	0.3	0.7	0.3	304
Mango	73.6	7.9	11.6	3.8	1.1	0.4	0.8	0.8	266
Oil-palm	65.9	10.6	7.1	2.7	11.5	0.3	1.0	0.9	775
Guava	83.3	0.0	16.7	0.0	0.0	0.0	0.0	0.0	6
Pawpaw	50.0	7.1	38.1	2.4	0.0	0.0	2.4	0.0	42
Shea nut	60.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	10
Rubber	81.8	0.0	11.4	0.0	6.8	0.0	0.0	0.0	44

12.8.4 Land size and types of tree crops

A total of 6,025 acres of land is under the cultivation of tree crops of which cocoa cultivation (60.4%), oil-palm (13.2%) and cashew (12.0%) together represent 85.6 percent of the total land area under cultivation of tree crops. Most of the land for cocoa cultivation (64.4%) are less than 5 acres in size.

About nine in ten of institutions which are cultivating avocado (88.6%) and guava (85.7%) use land with sizes less than 5 acres while more than two-thirds of the land used for the cultivation of coconut (75.6%), banana (74.6%), citrus (70.2%) and pawpaw (67.4%) are less than 5 acres. At least 40 percent of the land used for cultivation of rubber (51.9%) and coffee (40.0) are of sizes 10 acres or larger (Table 12.33).

Table 12.33: Land parcels of tree crop institutions by type of crop, and by size (acres) of parcel

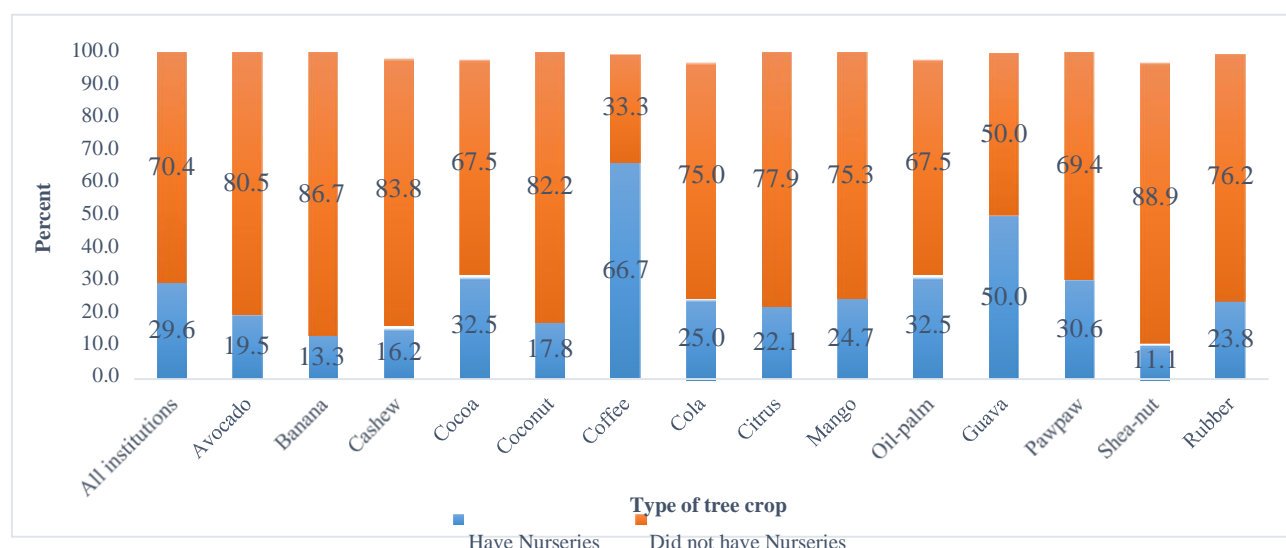
Tree crops)	Plot size group (acres)			Total	Total number*	Share %
	<5	5 - <10	10+			
All plots	3,783	1,202	1,040	6,025	6,025	100.0
Total	62.8	20.0	17.3	100.0		
Avocado	88.6	2.3	9.1	100.0	44	0.7
Banana	74.6	7.5	17.9	100.0	67	1.1
Cashew	52.3	23.3	24.4	100.0	726	12.0
Cocoa	64.4	21.4	14.2	100.0	3,637	60.4
Coconut	75.6	11.6	12.8	100.0	172	2.9
Coffee	33.3	26.7	40.0	100.0	15	0.2
Cola	61.5	15.4	23.1	100.0	13	0.2
Citrus	70.2	12.2	17.6	100.0	312	5.2
Mango	64.9	12.1	23.0	100.0	305	5.1
Oil-palm	59.0	20.6	20.4	100.0	795	13.2
Guava	85.7	14.3	0.0	100.0	7	0.1
Pawpaw	67.4	7.0	25.6	100.0	43	0.7
Shea nut	81.8	18.2	0.0	100.0	11	0.2
Rubber	38.5	9.6	51.9	100.0	52	0.9

* An institution could engage in multiple activities

12.8.5 Ownership of nurseries

About three in ten institutions have nurseries for the cultivation of tree crops. The higher proportions of these institutions with nurseries are engaged in coffee (66.7%) and guava (50.0%). Ownership of nurseries for crops below the average (27.7%) are shea nut (11.1 %), banana (13.3%), cashew (16.2%), coconuts (17.8%), avocado (19.5%), citrus (22.1%), rubber (23.8%), mango (24.7%) and cola (25.0 %), see Figure 12.7.

Figure 12.7: Type of tree crops of agricultural institutions with nurseries (percent)



12.8.6 Use of selected inputs in tree crop cultivation

The use of modern inputs such as fertilizer, pesticide and irrigation varies by type of tree crops under cultivation. The proportion of agricultural institutions that use fertilizer in the cultivation of tree crops is 46.2 percent compared to 85.8 percent that use pesticide while only 12.8 percent use irrigation. About 62 percent of institutions that cultivate cocoa and more than half of institutions that grow pawpaw (55.6%) and rubber (52.4%) use fertilizer. None of the institutions that grow shea nut use fertilizer. Almost all institutions that grow cocoa (91.3%) use pesticide and more than four-fifths of the institutions that cultivate coffee (86.7%), rubber (85.7%) and cashew (82.1%) use pesticides. About 41 percent of institutions that are cultivating pawpaw (41.7%) and coffee (40.0%) use irrigation, while about one-quarter of institutions that grow cola and about one-fifth that cultivate shea nut (22.2%) and rubber (21.4%) also use irrigation in the cultivation of these tree crops (Table 12.34).

Table 12.34: Tree crop institutions by type of tree crop, and by use of fertilizer, pesticide and irrigation

	Fertilizer			Pesticide			Irrigation		
	Did not			Did not			Did not		
Tree crop	Use	Use	Total	Use	Use	Total	Use	Use	
All institutions	2,317	2,702	5,019	4,308	711	5,019	643	4,376	5,019
Total	46.2	53.8		85.8	14.2		12.8	87.2	
Avocado	19.5	80.5	53	56.1	43.9	41	17.1	82.9	41
Banana	21.7	78.3	60	58.3	41.7	60	15.0	85.0	60
Cashew	6.8	93.2	693	82.1	17.9	693	5.8	94.2	693
Cocoa	61.5	38.5	3,254	91.3	8.7	3,254	13.7	86.3	3,254
Coconut	13.5	86.5	163	53.4	46.6	163	14.7	85.3	163
Coffee	40.0	60.0	15	86.7	13.3	15	40.0	60.0	15
Cola	33.3	66.7	12	66.7	33.3	12	25.0	75.0	12
Citrus	15.2	84.8	290	77.6	22.4	290	10.7	89.3	290
Mango	29.4	70.6	255	75.3	24.7	255	21.6	78.4	255
Oil-palm	24.1	75.9	718	72.3	27.7	718	11.8	88.2	718
Guava	33.3	66.7	6	66.7	33.3	6	33.3	66.7	6
Pawpaw	55.6	44.4	36	77.8	22.2	36	41.7	58.3	36
Shea nut	0.0	100.0	9	22.2	77.8	9	22.2	77.8	9
Rubber	52.4	47.6	42	85.7	14.3	42	21.4	78.6	42

12.8.7 Agro-ecological zones of institutions engaged in the cultivation of tree crops

Institutions that grow tree crops are mostly located in the forest zone. About three-quarters (73.9%) of the institutions operate from the forest agro-ecological zone of the country with 651 (13.0%) in coastal savannah zone and 546 (10.9%) in transitional zone. The number of institutions that are located in rural areas of each zone is higher than urban areas with the exception of the coastal savannah zone where the number of institutions in the urban areas is more than in rural areas.

About four-fifths of the institutions in the coastal savannah zone cultivate cocoa (62.4%) and oil-palm (17.4%). Almost all institutions in the forest zone (92.2%) either cultivate cocoa (76.1%) or oil-palm (16.1%). More than nine in ten of the institutions in the transitional zone cultivate cashew; and for those in northern savannah, 98.2 percent either cultivate cashew (59.8%) or mango (38.4%), see Table 12.35.

Table 12.35: Tree crop institutions by type of crop, and by agro-ecological zone and type of locality

Tree crop	Coastal Savannah			Forest			Transitional Zone			Northern Savannah		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All institutions	550	101	651	1,260	2,450	3,710	180	366	546	38	74	112
Avocado	1.5	0.0	1.2	0.6	0.8	0.8	0.6	0.0	0.2	2.6	4.1	3.6
Banana	1.5	3.0	1.7	1.0	1.4	1.2	0.6	0.5	0.5	0.0	0.0	0.0
Cashew	3.3	2.0	3.1	4.4	1.5	2.5	96.1	92.9	94.0	84.2	47.3	59.8
Cocoa	67.1	36.6	62.4	72.5	77.9	76.1	4.4	4.1	4.2	2.6	1.4	1.8
Coconut	7.1	7.9	7.2	3.1	3.0	3.0	0.0	0.3	0.2	2.6	1.4	1.8
Coffee	0.4	0.0	0.3	0.2	0.4	0.3	0.6	0.0	0.2	0.0	0.0	0.0
Cola	0.5	0.0	0.5	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Citrus	4.2	18.8	6.5	7.6	5.6	6.3	3.3	1.1	1.8	2.6	5.4	4.5
Mango	8.5	27.7	11.5	3.6	2.4	2.8	5.6	6.3	6.0	21.1	47.3	38.4
Oil-palm	17.3	17.8	17.4	19.3	14.4	16.1	1.7	0.3	0.7	5.3	4.1	4.5
Guava	0.4	0.0	0.3	0.0	0.1	0.1	0.0	0.0	0.0	2.6	0.0	0.9
Pawpaw	1.6	1.0	1.5	0.3	0.9	0.7	0.0	0.0	0.0	2.6	0.0	0.9
Shea nut	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	2.6	6.8	5.4
Rubber	1.5	0.0	1.2	1.0	0.9	0.9	0.6	0.0	0.2	0.0	0.0	0.0

12.8.8 Purpose of cultivating tree crops by institutions

The purpose of cultivating tree crops for majority of institutions (4,208, representing 83.8 percent out of the total 5,019 institutions) is sale only and for sale with minor consumption, 599 (11.9%). A similar pattern is observed for institutions in both rural and urban areas.

About three-quarters of the institutions engaged in tree crops for sale only cultivate cocoa, followed by cashew, 15.8 percent. Three crops—oil-palm (58.8%), citrus (35.3%) and mango (23.5%)—are the major focus of institutions cultivating for own consumption with minor sales. A similar pattern is observed for institutions cultivating for own consumption only in both urban and rural areas (Table 12.36).

Table 12.36: Tree crop institutions by type of crop, and by purpose for production and type of locality

Type of tree crop	Own consumption only			Own consumption with minor sales			Sales only			Sales with minor consumption		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All institutions	93	85	178	13	21	34	1,635	2,573	4,208	287	312	599
Avocado	8.6	10.6	9.6	0.0	9.5	5.9	0.5	0.3	0.4	0.7	1.0	0.8
Banana	11.8	10.6	11.2	0.0	9.5	5.9	0.4	0.4	0.4	1.4	5.4	3.5
Cashew	3.2	5.9	4.5	0.0	4.8	2.9	16.2	15.5	15.8	3.8	3.2	3.5
Cocoa	5.4	10.6	7.9	7.7	0.0	2.9	75.5	75.3	75.4	17.8	4.8	11.0
Coconut	21.5	11.8	16.9	15.4	4.8	8.8	1.9	1.7	1.8	9.1	9.0	9.0
Coffee	0.0	1.2	0.6	0.0	4.8	2.9	0.3	0.3	0.3	0.0	0.0	0.0
Cola	0.0	0.0	0.0	0.0	4.8	2.9	0.4	0.1	0.2	0.7	0.0	0.3
Citrus	23.7	27.1	25.3	23.1	42.9	35.3	2.9	2.5	2.7	18.5	21.5	20.0
Mango	30.1	27.1	28.7	23.1	23.8	23.5	2.5	2.8	2.7	13.2	14.4	13.9
Oil-palm	39.8	31.8	36.0	46.2	66.7	58.8	9.9	6.7	8.0	48.1	51.6	49.9
Guava	1.1	0.0	0.6	0.0	4.8	2.9	0.1	0.1	0.1	0.0	0.0	0.0
Pawpaw	6.5	1.2	3.9	0.0	4.8	2.9	0.3	0.7	0.5	1.0	1.0	1.0
Shea nut	0.0	0.0	0.0	0.0	4.8	2.9	0.1	0.2	0.2	0.0	0.0	0.0
Rubber	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.8	1.0	0.3	0.0	0.2

12.8.9 Production, sale and cost of production of tree crops

A total of 503,282 metric tonnes of tree crops were produced by institutions of which 433,766, representing 86.2 percent, were in rural areas. The quantity of oil-palm produced represented 75.7 percent of total production. In the urban areas, citrus (36.7%) and oil-palm (34.6%) were the major quantities. Institutions in the rural areas produced the highest quantity of oil-palm. (Tables 12. 37).

Table 12.37: Quantity (mts) from tree crop institution by type of crop, and by quantity produced, quantity sold, cost of production (GHC) and type of locality

Type of holder/ Type of tree crop	Produce (Tonnes)			Number	Sales (Tonnes)			Number	Cost of production (GHC1000)			
	Urban	Rural	Total		Urban	Rural	Total		Urban	Rural	Total	Number
Total	69,516	433,766	503,282	503,282	48,916	392,047	440,963	440,963	4,016	7,272	11,288	11,288
Avocado	0.1	0.0	0.0	79	0.1	0.0	0.0	75	1.5	0.1	0.6	63
Banana	8.0	1.0	1.9	9,743	11.3	1.1	2.2	9,671	0.3	7.4	4.9	550
Cashew	1.3	0.2	0.4	1,930	1.8	0.3	0.4	1,911	8.1	4.1	5.5	624
Cocoa	4.7	1.1	1.6	7,864	6.7	1.2	1.8	7,786	62.2	43.7	50.3	5,677
Coconut	2.0	0.5	0.7	3,651	2.3	0.6	0.8	3,330	1.9	1.3	1.5	172
Coffee	0.0	0.2	0.2	818	0.0	0.2	0.2	818	0.1	0.8	0.5	60
Cola	0.0	0.1	0.1	358	0.0	0.1	0.1	358	0.1	0.0	0.0	5
Citrus	36.7	5.3	9.7	48,709	14.2	5.5	6.5	28,563	4.3	3.2	3.6	408
Mango	7.4	2.0	2.7	13,805	9.4	2.2	3.0	13,091	4.5	9.9	8.0	899
Oil-palm	34.6	82.3	75.7	380,913	46.9	80.9	77.1	340,053	15.4	22.5	20.0	2,259
Guava	0.0	0.0	0.0	47	0.0	0.0	0.0	46	0.0	0.0	0.0	3
Pawpaw	5.0	7.3	7.0	35,191	7.1	8.1	8.0	35,146	0.9	2.6	2.0	223
Shea nut	0.0	0.0	0.0	174	0.1	0.0	0.0	116	0.0	0.0	0.0	2
Rubber	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0

12.9 Livestock rearing

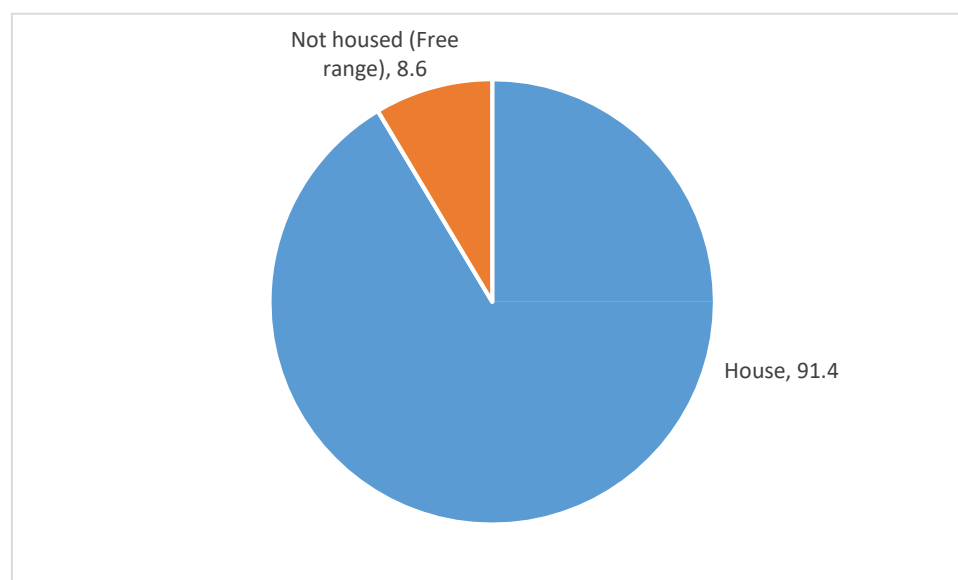
12.9.1 Housing of livestock

The number of agricultural institutions involved in the rearing of livestock is 3,272 of which 2,060, representing 63.0 percent, are in rural areas. Nine in ten institutions both in rural and urban areas house their livestock (Table 12.38).

Table 12.38: Livestock institutions by type of housing practiced, and by type of locality

Housing Status	Number of institutions				
	Urban	%	Rural	%	Total
Total	1,212	100.0	2,060	100.0	3,272
House	1,115	92.0	1,876	91.1	2,991
Not housed (Free range)	97	8.0	184	8.9	281

Almost all institutions rearing livestock house the livestock. Only about 9 percent of the institutions do not house the livestock.

Figure 12.8: Livestock institutions by type of housing practiced

The practice of livestock housing is more common among institutions which rear non-ruminants and poultry than those which rear ruminants. Among institutions, 85.0 percent rearing ruminants, 92.9 rearing non-ruminants and 93.9 rearing poultry house their livestock (Table 12.39).

Table 12.39: Livestock institutions by type of housing practiced, and by type of livestock classification and type of locality

Housing Status	Ruminants			Non-ruminants			Non-traditional livestock			Poultry		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
<i>Number of livestock at the beginning</i>												
Total	546	727	1,273	267	608	875	4	3	7	657	1,293	1,950
Housed	89.0	82.0	85.0	94.4	92.3	92.9	***	***	***	93.5	94.1	93.9
Not housed (Free range)	11.0	18.0	15.0	5.6	7.7	7.1	***	***	***	6.5	5.9	6.1

***Frequency too low for any comparison

12.9.2 Land tenure arrangements of agricultural institutions

More than four-fifths of institutions engaged in livestock rearing own housing facilities either through freehold (75.1%) or through inheritance (10.1%). Leasehold type of tenure arrangement is the next common, accounting for 6.6 percent of institutions. A similar pattern is observed for all types of livestock, except institutions engaged in non-traditional livestock

rearing, where the second most common type of land tenure arrangements after freehold is leasehold (27.3%), see Table 12.40.

Table 12.40: Livestock institutions by categories of livestock, and by type of tenure arrangement

Type of holding	Own/Freehold	Inheritance	Leasehold	Renting	Share-cropping	Squatting	Trusteeship	Other	Total
Total	3,094	415	273	174	13	64	60	29	4,122
Percentage									
Total	75.1	10.1	6.6	4.2	0.3	1.6	1.5	0.7	100.0
Ruminants	70.1	14.2	6.9	4.4	0.3	2.2	1.5	0.5	1,279
Non-ruminant	74.5	10.7	6.3	4.1	0.5	1.8	0.8	1.3	875
Non-traditional livestock	63.6	0.0	27.3	9.1	0.0	0.0	0.0	0.0	11
Poultry	78.6	7.2	6.5	4.1	0.3	1.0	1.7	0.6	1,957

12.9.3 Livestock rearing by Agro-ecological zones

More than half of institutions rearing livestock are located in the northern savannah zone (234,825), while about 32 percent are in the forest zone. Institutions in the coastal savannah are mostly engaged in the rearing of poultry (49.8%) and ruminants (42.2%). A similar pattern is observed across zones with the proportion of institutions engaged in the rearing of non-traditional livestock being the least (Table 12.41).

Table 12.41: Livestock institutions by categories of livestock, and by agro-ecological zone and type of locality

Livestock	Coastal Savannah			Forest			Transitional Zone			Northern Savannah		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	20,221	17,847	38,068	32,159	100,732	132,891	3,902	10,820	14,722	34,270	200,555	234,825
Ruminants	40.3	44.3	42.2	47.2	46.7	46.8	61.8	55.9	57.5	60.5	56.3	56.9
Non-ruminants	5.4	5.4	5.4	7.1	4.0	4.7	5.3	6.2	6.0	4.5	5.3	5.2
Non-traditional livestock	3.9	1.3	2.7	3.0	1.6	1.9	2.0	1.1	1.3	0.7	0.4	0.5
Poultry and Barn-yard	50.4	49.1	49.8	42.7	47.8	46.6	30.9	36.7	35.2	34.3	38.0	37.4

12.9.4 Purpose of livestock rearing by institutions

A total of 65,237, representing 15.5 percent of agricultural institutions engaged in livestock rearing, produce for the purpose of sale only and 52.5 percent produce for sale with minor consumption. About one-tenth (48,196) of the institutions rear livestock for the sole purpose of own consumption. More than two-thirds of institutions producing solely for own consumption are engaged in the rearing of poultry and about 70 percent of institutions producing for the purpose of sales only are rearing ruminants (Table 12.42).

Table 12.42: Livestock institutions by categories of livestock, and by purpose of production and type of locality

Livestock Type	Own consumption with									Sales with minor		
	Own consumption			minor sales			Sales only			consumption		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Total	15,327	32,869	48,196	16,046	70,109	86,155	14,355	50,882	65,237	44,824	176,094	220,918
Ruminants	30.3	29.1	29.5	43.5	40.8	41.3	64.2	72.3	70.6	57.2	56.2	56.4
Non-ruminants	0.6	2.0	1.5	1.9	2.2	2.1	13.9	10.0	10.9	6.2	5.1	5.3
Non-traditional livestock	1.6	0.8	1.1	1.5	0.6	0.8	3.1	1.2	1.6	2.5	0.8	1.2
Poultry	67.5	68.1	67.9	53.1	56.4	55.8	18.8	16.5	17.0	34.1	37.9	37.1

12.9.5 Type of produce from institutions rearing livestock by type of livestock

A total of 203,199 metric tonnes of meat were produced by institutions engaged in livestock rearing of which 50.4 percent and 49.3 percent were produced from ruminants and poultry respectively. Milk totalling 601,722 litres was produced from ruminants only. In addition, 3,235,285 crates of eggs were produced and hides totalling 1,083 square meters, mainly from ruminants was produced (Table 12.43).

Table 12.43: Quantity of produce from livestock institutions by type of livestock produce and categories of livestock

Type of Livestock Produce	Ruminants	Non-ruminants	Non-traditional livestock	Poultry	Total (kg)
Meat (kg)	102,421,623	517,198	4,576	100,256,246	203,199,643
Milk (litres)	601,722	0	0	0	601,722
Egg (crates)	0	0	0	3,235,285	3,235,285
Breed	3,910	879	67	2,928	7,784
Hide (sqm)	1,077	6	0	0	1,083
Traction	1,153	8	0	0	1,161
Dung (kg)	518,152	23,579	25	38,185	579,941
Other	3,116	1,150	137	100,750	105,153

12.9.6 Production, sale and cost of production of livestock

Livestock availability in the reference period

A total of 7,704,450 livestock were reared by institutions during the reference period of which 5,059,485 were by institutions in rural areas. Of the total livestock, 68.2 percent were at the beginning of the reference period (opening stock) while 15.9 percent was produced during the reference period and another 15.9 percent purchased. More than three-quarters of ruminants (77.7%) and more than two-thirds of poultry (68.1%) as well as 50.6 percent of non-ruminants and 22.7 percent of non-traditional livestock were at the beginning of the reference period.

A total of 2,904,233 of the available livestock constituted off-take of which 79.1 percent was sold. The proportion of the off-take that died was 17.3 percent. A similar pattern is observed for all types of livestock in urban and rural areas except for ruminants, where only about one-third of the total off-take was sold while more than half (54.7%) died. The proportion of the ruminants that were sold by institutions in urban areas was 13.7 percent, while the proportion that died was 81.5 percent.

At the end of the period (closing stock), a total of 4,800,217 livestock were available of which 3,572,585 were by institutions in rural areas. The total livestock available at the end of the

reference period represented 62.3 percent. The proportion of livestock available at the closing stock is higher in rural areas (70.6%) than urban areas (46.4%). A similar pattern is observed for all types of livestock both in urban and rural areas except for ruminants where the proportion available in urban areas (76.0%) was higher than in rural (70.8%), see Table 12.44.

Table 12.44: Quantity (number) of livestock from institutions by phases of livestock production, and by categories of livestock and type of locality

Quantity of Livestock	Ruminants			Non-Ruminants			Non-Traditional livestock			Poultry			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
<i>Livestock available</i>	134,343	86,298	220,641	36,465	69,148	105,613	214	178	392	2,473,943	4,903,861	7,377,804	2,644,965	5,059,485	7,704,450
Opening stock	84.0	67.9	77.7	44.4	54.0	50.6	23.4	21.9	22.7	79.1	62.6	68.1	78.8	62.6	68.2
Produced	13.7	19.2	15.9	49.4	36.2	40.8	46.2	78.1	60.7	9.6	18.5	15.6	10.4	18.8	15.9
Purchases	2.3	12.9	6.4	6.2	9.8	8.6	30.4	0.0	16.6	11.3	18.9	16.3	10.8	18.6	15.9
<i>Total Off-Take</i>	32,263	25,196	57,459	16,797	25,082	41,879	104	17	121	1,368,169	1,436,605	2,804,774	1,417,333	1,486,900	2,904,233
consumed	2.7	7.3	4.7	5.3	5.2	5.2	26.0	0.0	22.3	1.1	2.1	1.6	1.2	2.2	1.7
sold	13.7	63.4	35.5	79.3	76.7	77.8	62.5	94.1	66.9	82.5	77.7	80.0	80.9	77.4	79.1
died	81.5	20.3	54.7	10.8	14.9	13.3	6.7	5.9	6.6	15.4	17.8	16.6	16.9	17.8	17.3
stolen	1.3	2.4	1.8	0.8	0.9	0.8	4.8	0.0	4.1	0.2	0.7	0.5	0.2	0.7	0.5
given out	0.8	6.6	3.3	3.8	2.4	2.9	0.0	0.0	0.0	0.7	1.8	1.3	0.8	1.9	1.3
<i>Closing stock</i>	102,080	61,102	163,182	19,668	44,066	63,734	110	161	271	1,105,774	3,467,256	4,573,030	1,227,632	3,572,585	4,800,217
Total	76.0	70.8	74.0	53.9	63.7	60.3	51.4	90.4	69.1	44.7	70.7	62.0	46.4	70.6	62.3

Livestock off-take in the reference period

The total off-take of livestock in the reference period was 37.7 percent of the total quantity available. Non-ruminants and poultry had the highest proportion of off-take (39.7% and 38.0% respectively), while ruminants had the least off-take. A similar pattern was observed in both urban and rural areas. However, the proportion of off-take in urban areas (53.6%) was higher than in rural areas (29.4%), see Table 12.45.

Table 12.45: Quantity (number) of livestock from institutions by type of livestock classification, and by type of locality, quantity available and quantity off-take

Type of livestock	Urban			Rural			Total		
	Quantity	Off-take		Quantity	Off-take		Quantity	Off-take	
	Available	Quantity	%	Available	Quantity	%	Available	Quantity	%
Total	2,644,965	1,417,333	53.6	5,059,485	1,486,900	29.4	7,704,450	2,904,233	37.7
Ruminants	134,343	32,263	24.0	86,298	25,196	29.2	220,641	57,459	26.0
Non-ruminants	36,465	16,797	46.1	69,148	25,082	36.3	105,613	41,879	39.7
Non-traditional livestock	214	104	48.6	178	17	9.6	392	121	30.9
Poultry	2,473,943	1,368,169	55.3	4,903,861	1,436,605	29.3	7,377,804	2,804,774	38.0

Livestock produce during the reference period

During the reference period, a total of 1,225,028 livestock were produced, of which 950,668 (77.6%) were in rural areas. A total of 1,146,693 (93.6%) poultry were produced. The total number of livestock sold (2,297,417) in the reference period was about twice (1.9 times) as high as the number produced (1,225,028). (Table 12.46).

Table 12.46: Quantity (number) of livestock from institutions by quantity production, quantity sold, cost of production sales and type of locality

Type of livestock	Quantity produced			Quantity sold			Cost of production (000)		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
Total	274,360	950,668	1,225,028	1,146,556	1,150,861	2,297,417*	17,137,367	53,581,876	70,719,243
Ruminants	6.7	1.7	35,043	0.4	1.4	20,396	9.5	2.9	3,155,943
Non-ruminants	6.6	2.6	43,054	1.2	1.7	32,563	9.9	7.4	5,637,993
Non-traditional livestock	0.0	0.0	238	0.0	0.0	81	0.1	0.0	13,070
Poultry	86.7	95.6	1,146,693	98.4	96.9	2,244,377	80.6	89.8	61,912,237

* The quantity sold is from quantity available 7,704,450, see Table 12.44.

12.10 Forest trees

12.10.1 Institutions engaged in cultivating forest trees

A total of 329 agricultural institutions are involved in forest tree production of which more than half (210) are in rural areas. For the market-oriented classification¹⁴, eight in ten institutions cultivate forest trees classified as “Export only” while an additional 15.2 percent cultivate forest trees classified as “Domestic only”. For the policy-oriented classification, almost all institutions (92.7%) cultivate forest tree classified as “Common species”. A similar pattern is observed for institutions in urban and rural areas (Table 12.47).

¹⁴ Forest trees are classified according to either market-oriented classification or policy-oriented classification.

Table 12.47: Forest tree institutions by type of market-oriented and policy-oriented forest tree classifications, and by type of locality

Classifications	Urban	%	Rural	%	Total	%
Market-oriented classification						
Total	119	100.0	210	100.0	329	100.0
Export Only	2	1.7	1	0.5	3	0.9
Domestic Only	16	13.4	34	16.2	50	15.2
Export and Domestic	95	79.8	171	81.4	266	80.9
Other*	6	5.0	4	1.9	10	3.0
Policy-oriented classification						
Total	119	100.0	210	100.0	329	100.0
Protected	4	3.4	2	1.0	6	1.8
Promoted	6	5.0	12	5.7	18	5.5
Common species	109	91.6	196	93.3	305	92.7

12.10.2 Land tenure arrangements

Market-oriented classification

Ownership through freehold and inheritance are the most common land tenure arrangements engaged in by institutions in the cultivation of forest trees. Nine in ten institutions own the land parcels used in the cultivation of forest trees, either through freehold (81.8%) or through inheritance (8.2%). About one-third of institutions cultivating forest trees classified as “Export and Domestic” make trusteeship arrangement for the land parcels used. Whereas trusteeship arrangement is the second highest proportion to freehold, share-cropping arrangement is practiced only among institutions engaged in the cultivation of forest trees classified as “Export only” (8.0%) and “Domestic only” (2.3%), see Table 12.48.

Table 12.48: Forest tree institutions by type of market-oriented forest tree classification, and by land tenure arrangement

Market-oriented classification	Own/ Freehold	Inheritance	Leasehold	Renting	Share-cropping	Trusteeship	Other	Total
Number of institutions								
Total	269	27	4	2	10	10	7	329
Export and Domestic	2	0	0	0	0	1	0	3
Export only	38	4	1		4	1	2	50
Domestic only	224	20	2	2	6	8	4	266
*Other	5	3	1	0	0	0	1	10
Percentage								
Total	81.8	8.2	1.2	0.6	3.0	3.0	2.1	100.0
Export and Domestic	66.7	0.0	0.0	0.0	0.0	33.3	0.0	100.0
Export only	76.0	8.0	2.0	0.0	8.0	2.0	4.0	100.0
Domestic only	84.2	7.5	0.8	0.8	2.3	3.0	1.5	100.0
*Other	50.0	30.0	10.0	0.0	0.0	0.0	10.0	100.0

* Other refers to other tree species of potential value yet unknown on the market

Policy-oriented classification

More than eight in ten institutions in the policy-oriented classification own land parcels used for cultivating forest trees classified as “Protected” either through freehold (66.7%) or inheritance (16.7%). For forest trees classified as “Promoted”, the type of land tenure arrangements mostly used are ownership through freehold (88.9%), or renting (5.6%), while for forest trees classified as “Common species”, the proportion that own the land parcels through freehold is 81.6 percent and through inheritance is 8.5 percent (Table 12.49).

Table 12.49: Forest tree institutions by type of policy-oriented forest tree classification, and by land tenure arrangement

Policy-oriented classification	Own/Freehold	Inheritance	Leasehold	Renting	Share-cropping	Trusteeship	Other	Total
Number of institutions								
Total	269	27	4	2	10	10	7	329
Protected	4	1				1		6
Promoted	16			1			1	18
Common species	249	26	4	1	10	9	6	305
Percentage								
Total	81.8	8.2	1.2	0.6	3.0	3.0	2.1	100.0
Protected	66.7	16.7	0.0	0.0	0.0	16.7	0.0	100.0
Promoted	88.9	0.0	0.0	5.6	0.0	0.0	5.6	100.0
Common species	81.6	8.5	1.3	0.3	3.3	3.0	2.0	100.0

12.10.3 Forest trees and nurseries

A total of 3,319,037 forest trees were grown by institutions of which 1,941,860 (58.5%) were in urban areas. Teak (26.9%), eucalyptus (22.1%), ofram (11.6%) and cedrell (10.7%) which together constituted 71.3 percent were the major forest trees produced by institutions. For institutions in urban areas, teak (31.6%), cedrell (18.2%), ofram (15.1%) and kuisa (10.0%) were the major forest trees, while in rural areas, eucalyptus (53.2%) and teak (29.2%) were the major forest trees produced.

Agricultural institutions nursed a total of 1,633,957 seedlings of which 1,311,002 (80.2%) were by institutions in urban areas. Teak (23.1%), ofram (17.8%), cedrell (16.2%) and wawa (12.8%) had the highest proportion of nurseries and together constituted 69.9 percent. There was no institution involved in the production of seedlings of eucalyptus and gmelina (Table 12.50).

Table 12.50: Quantity (number) nurseries from institutions by type of species, and by quantity of forest trees, seedlings (nurseries) and type of locality

Type of Tree	Number of forest trees						Number of nurseries					
	Urban	%	Rural	%	Total	%	Urban	%	Rural	%	Total	%
Total	1,941,860	100.0	1,377,177	100.0	3,319,037	100.0	1,311,002	100.0	322,955	100.0	1,633,957	100.0
Wawa	196,780	10.1	71,400	5.2	268,180	8.1	139,330	10.6	69,980	21.7	209,310	12.8
Teak	613,789	31.6	278,526	20.2	892,315	26.9	358,739	27.4	18,039	5.6	376,778	23.1
Potrodum	1,280	0.1	0	0.0	1,280	0.0	1,130	0.1	0	0.0	1,130	0.1
Ofram	293,231	15.1	90,496	6.6	383,727	11.6	212,448	16.2	78,487	24.3	290,935	17.8
Kuisa	194,030	10.0	80	0.0	194,110	5.8	139,670	10.7	53	0.0	139,723	8.6
Emeri	76,278	3.9	234	0.0	76,512	2.3	56,555	4.3	42	0.0	56,597	3.5
Awimfosamit	540	0.0	70,000	5.1	70,540	2.1	420	0.0	69,000	21.4	69,420	4.2
Mahogany	88,824	4.6	81,974	6.0	170,798	5.1	65,135	5.0	71,019	22.0	136,154	8.3
Acacia	11,015	0.6	33,996	2.5	45,011	1.4	1,661	0.1	8,935	2.8	10,596	0.6
Iroko	55	0.0	350	0.0	405	0.0	20	0.0	0	0.0	20	0.0
Neem tree	273	0.0	7,651	0.6	7,924	0.2	235	0.0	6,089	1.9	6,324	0.4
Cedrell	353,558	18.2	2,550	0.2	356,108	10.7	263,608	20.1	400	0.1	264,008	16.2
Gmelina	5	0.0	0	0.0	5	0.0	0	0.0	0	0.0	0	0.0
Odum	3,700	0.2	135	0.0	3,835	0.1	2,500	0.2	115	0.0	2,615	0.2
Eucalyptus	1,500	0.1	733,000	53.2	734,500	22.1	0	0.0	0	0.0	0	0.0
Ceiba	75,558	3.9	10	0.0	75,568	2.3	59,253	4.5	6	0.0	59,259	3.6
Sapele	100	0.0	6,110	0.4	6,210	0.2	20	0.0	690	0.2	710	0.0
Other	31,344	1.6	665	0.0	32,009	1.0	10,278	0.8	100	0.0	10,378	0.6

12.10.4 Land size and type of forest tree

More than half (59.7%) of the total number of forest trees are cultivated on land parcels that are of sizes 50 acres or larger with higher proportions by institutions in urban areas (64.0%) than rural areas (53.7%). Less than one-fifth (17.6%) of forest trees are cultivated on land parcels that are less than 20 acres in size. For institutions in urban areas which cultivated forest trees classified as "Export only", 89.2 percent of the parcels are 50 acres or larger, while for

their counterparts in rural areas, 85.1 percent of the land sizes are less than 20 acres. A similar pattern is observed for forest trees classified as “Export and Domestic”.

Institutions in rural areas cultivate 95.2 percent of trees classified as “Domestic only” on land parcels that are 50 acres or larger while institutions in urban areas cultivate 27.9 percent on land sizes 50 acres or larger.

The pattern observed for forest trees under policy-oriented classification is similar to that observed for “Export only” classification. For forest trees classified as “Common species”, more than half of the number of trees cultivated by institutions in both urban and rural areas are on land sizes that are 50 acres or larger (Table 12.51).

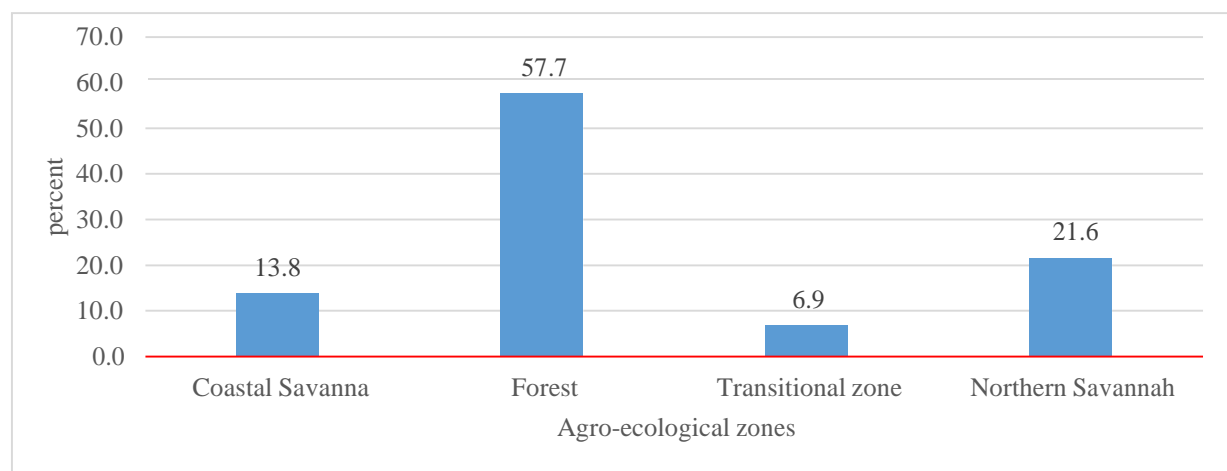
Table 12.51: Forest tree institutions by type of market-oriented and policy-oriented forest tree classifications and by land size (acres)

Classifications	Type of locality	Size of Plantation					Total (Forest trees)
		less than 20		30-39			
		acres	20-29 acres	acres	40-49 acres	50+ acres	
Total	Total	17.6	13.5	2.1	7.0	59.7	3,319,037
	Urban	10.7	11.4	2.9	10.9	64.0	1,941,860
	Rural	27.4	16.4	1.0	1.4	53.7	1,377,177
Market-oriented classification							
Export only	Total	70.4	1.3	12.2	0.0	16.2	7,895
	Urban	3.8	7.0	0.0	0.0	89.2	1,435
	Rural	85.1	0.0	14.9	0.0	0.0	6,460
Domestic only	Total	2.7	1.0	0.7	1.5	94.1	787,435
	Urban	15.4	41.0	15.6	0.0	27.9	12,788
	Rural	2.5	0.4	0.4	1.5	95.2	774,647
Export and Domestic	Total	22.3	16.6	2.6	8.8	49.8	2,491,698
	Urban	10.7	10.0	2.9	11.2	65.3	1,896,293
	Rural	59.1	37.6	1.6	1.4	0.4	595,405
Other	Total	11.7	86.9	1.4	0.0	0.0	32,009
	Urban	9.9	88.7	1.4	0.0	0.0	31,344
	Rural	100.0	0.0	0.0	0.0	0.0	665
Policy-oriented classification							
Protected	Total	0.2	0.5	0.0	33.3	66.0	198,350
	Urban	0.0	0.5	0.0	33.4	66.1	197,785
	Rural	68.3	0.0	2.5	0.0	29.2	565
Promoted	Total	20.9	3.1	0.2	0.0	75.8	385,007
	Urban	0.1	0.6	0.3	0.0	99.0	294,511
	Rural	88.8	11.1	0.0	0.0	0.2	90,496
Common species	Total	18.4	15.9	2.6	6.1	57.0	2,735,680
	Urban	14.3	15.1	3.9	10.1	56.6	1,449,564
	Rural	23.1	16.8	1.1	1.5	57.5	1,286,116

12.10.5 Agro-ecological zones of institutions engaged in the cultivation of forest trees

More than half of the institutions cultivating forest trees are located in the forest zone and about one-fifth are in the northern savannah zone. Only about 7 percent of institutions engaged in the cultivation of forest trees are in the transitional zone with twice as many in the coastal savannah zone (Figure 12.8).

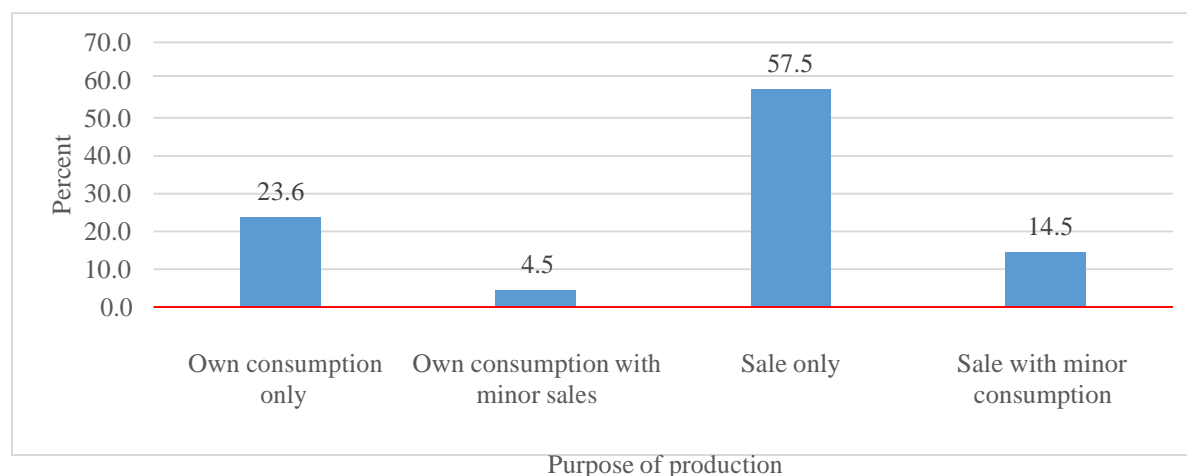
Figure 12.9: Agro-ecological zones of forest tree agricultural institutions (percent)



12.10.6 Purpose of cultivating forest tree by institutions

More than half of institutions cultivate forest trees for sale only, whereas 14.5 percent cultivate for sales with minor consumption; and about one-quarter (23.6%), cultivate solely for own consumption.

Figure 12.10: Purpose of production of forest tree agricultural institutions (percent)



12.10.7 Production, sales and cost of forest tree production

Forest trees classified as “Export and Domestic” were the major ones (1,604,799) produced by institutions and accounted for 48.4 percent of the total forest trees produced. About 98 percent of forest trees produced by institutions in urban areas were forest trees classified as “Export and Domestic”, while 56.2 percent of forest trees produced by institutions in rural areas were

classified as “Domestic only”. Almost all forest trees produced by institutions in rural areas

were classified as “Common species” in the policy-oriented classification compared to 74.6 percent of same classification by institutions in the urban areas.

The forest trees classified as “Export and Domestic” dominated the sales of institutions in both urban (91.6%) and rural (84.3%) areas. By the policy-oriented classification, forest trees sold by institutions were predominantly of the “Common species” in both urban (97.3%) and rural (85.8%) areas.

The total cost of production for forest trees in urban areas (GH¢1,165,385) was 3.5 times higher than in rural areas (GH¢333,450). For both urban and rural areas, “Export and Domestic” type of market-oriented classification had the highest total cost of production of forest trees (66.7% and 79.6%, respectively) and for policy-oriented classification “Common species” had the highest total cost of production of forest trees (90.1% and 80.2%, respectively), see Tables 12.52.

Table 12.52: Quantity (singles) from forest tree institutions by type of market-oriented and policy-oriented forest tree classification, and by quantity production, quantity sold, cost of production and type of locality

Type of forest tree	Quantity produced			Quantity Sold			Cost of production (GH¢)		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
Market-oriented classification									
Total	1,941,860	1,377,177	3,319,037	56,668	22,974	79,642	1,165,385	333,450	1,498,835
Export Only	0.1	0.5	1,860	0.0	0.7	150	0.4	12.8	47,600
Domestic Only	0.7	56.2	16,920	7.7	15.1	7,845	13.6	6.5	179,979
Export & Domestic	97.7	43.2	1,604,799	91.6	84.3	71,244	66.7	79.6	1,042,948
Other*	1.6	0.0	10,378	0.7	0.0	403	19.3	1.1	228,308
Policy-oriented classification									
Total	1,941,860	1,377,177	3,319,037	56,668	22,974	79,642	1,165,385	333,450	1,498,835
Protected	10.2	0.0	142,358	0.7	0.7	565	2.6	9.0	59,950
Promoted	15.2	6.6	292,065	2.0	13.5	4,226	7.4	10.7	121,470
Common species	74.6	93.4	1,199,534	97.3	85.8	74,851	90.1	80.2	1,317,415

12.11 Total agricultural production, sales and cost of production (households and institutions)

A total of 30,973,628 metric tonnes of arable crops were produced of which 24,078,065 mt were sold. Individual households produced about 94 percent of the quantity of arables crops. Most of the arable crops (24,131,763 mt) were produce in the rural areas. Tree crop production, which is mostly exported, constituted about 13 percent of total arable and tree crops. A total of 60,539,846 forest trees were being cultivated of which production from individual household holders constituted about 96 percent. Asimilar pattern is observed for capture fisheries where about 89 percent of total metric tonnes of aquaculture was produced by individual household holders. Conversely, about two-thirds of aquaculture was produced by institutions.

All agriucultural—arable crops, tree crops, livestock and forest trees— were mostly produced by holders in the rural areas except aquaculture where majority (54.4%) of the quantity were produced by holders in urban areas. Capture fisheries were produced in both urban and rural areas.

Table 12.53: Quantity (metric tonnes) of agriculture from households and institutions by type of agriculture, and type of locality, and by quantity produced, quantity sold and cost of production

Types of Activity	Quantity produced			Quantity sold			Cost of Production		
	Household	Institution	Total	Household	Institution	Total	Household	Institution	Total
Total									
Arable	29,019,363	1,954,265	30,973,628	22,194,541	1,883,524	24,078,065	1,923,375,000	33,891,000	1,957,266,000
Tree crops	4,316,450	503,282	4,819,732	3,901,280	440,963	4,342,243	1,113,629,000	11,288,000	1,124,917,000
Livestock	6,831,828	1,225,028	8,056,856	4,006,717	2,297,417	6,304,134	198,259,358	70,719,243	268,978,601
Capture									
Fisheries	430,455	54,317	484,772	270,535	51,022	321,556	Na*	Na	Na
Aquaculture	18,134,477	39,095,450	57,229,927	7,088,962	34,283,000	41,371,962	13,135,622	132,676,690	145,812,312
Forest Trees	57,220,809	3,319,037	60,539,846	22,889,090	79,642	22,968,732	Na	1,498,835	Na
Urban									
Arable	6,066,356	593,509	6,659,865	4,767,505	574,150	5,341,655	457,818,000	12,549,000	470,367,000
Tree crops	1,355,206	69,516	1,424,722	1,199,656	48,916	1,248,572	267,966,000	4,016,000	271,982,000
Livestock	2,144,102	274,360	2,418,462	2,094,422	1,146,556	3,240,978	101,681,322	17,137,367	118,818,689
Capture									
Fisheries	254,321	28,856	283,177	283,177	27,106	310,283	Na	Na	Na
Aquaculture	9,138,836	21,989,150	31,127,986	2,934,801	18,278,500	21,213,301	6,476,824	33,892,910	40,369,734
Forest Trees	5,700,370	1,941,860	7,642,230	2,866,950	56,668	2,923,618	Na	1,165,385	Na
Rural									
Arable	22,953,007	1,360,756	24,313,763	17,427,037	1,309,374	18,736,411	1,465,557,000	21,342,000	1,486,899,000
Tree crops	2,961,245	433,766	3,395,011	2,701,624	392,047	3,093,671	845,663,000	7,272,000	852,935,000
Livestock	4,687,726	950,668	5,638,394	1,912,295	1,150,861	3,063,156	96,578,036	53,581,876	150,159,912
Capture									
Fisheries	176,134	25,461	201,595	201,595	23,916	225,511	Na	Na	Na
Aquaculture	8,995,641	17,106,300	26,101,941	4,154,161	16,004,500	20,158,661	6,658,798	98,783,780	105,442,578
Forest Trees	51,520,439	1,377,177	52,897,616	20,022,140	22,974	22,974	Na	333,450	Na

*Na information was not available

CHAPTER THIRTEEN

SUMMARY OF FINDINGS

13.1 Background characteristics of persons in agricultural households, persons engaged and holders

There are 2,585,531 agricultural households with a population of 11,340,947 persons of which 75.2 percent (8,527,553) are in rural areas. About 42 percent of the agricultural household population aged 15 years or older (3,037,381) are engaged in agricultural activities, of which 2,158,697 representing 71.0 percent, are agricultural holders and 30 percent of the agricultural household population.

There are more females (5,677,182) than males (5,663,765) in agricultural households with a sex ratio of 99.8 males to 100 females¹⁵. The proportion of males (55.2%) in agricultural households engaged in agricultural activities is about twice as high as that of females (28.3%), and the representation of males even higher among agricultural holders. Male holders (1,551,265) are 2.6 times as high as females (607,432).

Children (0-14 years) form 35.6 percent, the working age population (15-64 years), 60.0 percent, and the elderly (65 years or older), 4.4 percent of the population¹⁶.

13.1.1 Age-sex distribution of persons engaged in agriculture

Persons older than 35 years engaged in arable crop farming are proportionately more in urban areas (74.0%) than their counterparts in rural areas (66.9%). For persons engaged in tree crops, more than half (55.0%) are within the ages of 36 to 59 years, and more than a fifth (22.3%) are of ages 60 years or older. One-fifth (20.4%) of persons engaged in livestock rearing are between the ages of 25 and 35 years and 18.9 percent are aged over 60 years. A similar pattern is observed for the other types of agriculture except for capture fisheries where proportions of persons aged 60 years or more are less than 10 percent.

13.1.2 Age-sex distribution of holders

Majority (57.4%) of agricultural holders aged 15 years or older, are in the age group of 36-59 years and this is true for both males and females. Across all activities of agriculture, at least seven in ten of the holders are adults (36 years or older) and three-quarters or more of them are males. For arable crop holders, more than three-quarters are adults (36 years or older); for livestock rearing, 79.8 percent; for aquaculture holders, 82.9 percent; for holders in tree crop cultivation, 95.1 percent; and for forest tree holders, about 97 percent. The proportion of adults in any agriculture activity is lowest for capture fisheries with 72.2 percent of them being classified as adults. The proportion of male holders in these activities ranges from three-quarters (tree crops) to about 95 percent (aquaculture). A similar pattern is observed in both urban and rural areas.

13.1.3 Youth in agriculture

The population of the youth (15-35 years) in agricultural households is 4,077,618. This represents 36 percent of the total agricultural household population of which about three-quarters (3,017,163) are in the rural areas. About one-third (902,174) of persons engaged in

¹⁵ The sex ratio in the general population is 95.2 in 2010 (GSS, 2010 PHC)

¹⁶ This is similar to Ghana's population structure in 2010PHC (GSS, 2010 PHC)

agriculture are youth and about two-thirds of them are males. The proportion of female youth engaged in agriculture is higher in rural areas (34.2%) than in urban areas (29.7%). Less than one-fifth (17.1%) of the youth engaged in agriculture are agricultural holders (519,788), and more than three-quarters (77.0%) of them are males. Most youth holders are persons older than 24 years. There are about four times as many youth holders in rural areas (79.3%) as in urban areas (20.7%).

There is a higher proportion of youth holders in arable crop cultivation and capture fisheries than in any other type of agriculture.

13.1.4 Educational attainment of persons in agricultural households

The school-going age population (4 years or older) of agricultural households constitutes 93.7 percent of the total agricultural household population (11,340,947) of which 57.2 percent have attained basic level of education, 3.1 percent tertiary level of education and 27.2 percent never attended school. The proportion who never attended school is higher in rural areas (30.2%) than in urban areas (18.4%); and for females than males in both urban and rural areas. Conversely, the proportion who have attained secondary or higher levels of education is higher in urban areas than in rural areas; and for males than females in both urban and rural areas. The proportion who have attained basic level of education is about the same in both urban (56.5%) and rural (57.5%) areas.

13.1.5 Educational attainment of persons of agricultural household engaged in agriculture and holders

There is a higher proportion of the never attended school among persons engaged in agriculture as well as agricultural holders. Of the 3,037,381 persons aged 15 years or older engaged in agriculture, 42.3 percent have never attended school and 44.4 percent have attained basic level education. Similar to the pattern observed for all persons age 4 years or older in agricultural households, the proportion who have never attended school in the rural areas is 1.5 times the proportion in urban areas and the proportion who have attained secondary or higher levels of education in the urban areas is more than 2 times the proportion in the rural areas. Also, a higher proportion of males than females have attained secondary or higher levels of education while higher proportions of females than males never attended school. A similar pattern is again observed for holders.

13.1.6 Relationship to head of agricultural households

About 52 percent of the 11,340,947 agricultural household population are children of the household head and 14 percent are spouses of the head. The proportion of male-headed households in urban areas is two and half times that of females while for the rural areas there are 3 male-headed households to a female-headed household. Grandchildren constitute about 5 percent of the household population with a higher proportion in urban areas (5.5%) than in rural areas (4.8%). About 9 percent of the heads have no spouse.

13.1.7 Relationship of persons engaged to head of agricultural households

About 80 percent of persons engaged in agriculture are heads of the household and only about 12 percent are spouses of the head. Substantially, fewer children of household heads are engaged in agriculture. While a little more than half of the agricultural household population are children of the head, only 6 percent of those engaged are children of the head. A similar pattern of males dominating agricultural households as observed among the general population of agricultural households is also observed among persons engaged with a higher proportion of male heads in urban areas (92.9%) and rural areas (89.3%).

13.1.8 Relationship of holders to head of agricultural households

Almost all holders (91.7%) are heads of the household. Only about 5 percent of holders are spouses and about 2 percent are children of the head. The proportion of the extended family members who are holders is very low (1.4%).

13.1.9 Size of agricultural households

The average size of an agricultural household is about 7 persons per household with the sizes ranging from one to more than ten. One-fifth (20.4%) of the households are single member households and 5.5 percent have 10 or more persons in the household. There is an average of 3 persons engaged in agriculture per household. The proportion of single member households is 14.7 percent and 8.4 percent for households with 10 or more persons. A similar pattern is observed for holders.

13.1.10 Marital status of the population in agricultural households

More than half of the population of agricultural households are married (53.1%) while about a third (33.4%) have never married. A higher proportion of the married population is found in rural areas whereas a higher proportion of the never-married population is in urban areas. The proportion who are separated, widowed or divorced, is higher for females than for males. For those engaged in agriculture, about 70 percent of them are married and only about 10 percent are never married. A similar pattern is observed for persons who are holders with only about 6 percent of them being never married.

13.1.11 Nationality of population in agricultural households

Almost all agricultural household population are Ghanaian (99.8%) with little or no difference in the proportion of males and females or proportion in urban or rural areas. For other nationals, Togolese and Burkinabes are the majority of the non-Ghanaian agricultural household population. A similar pattern is observed for persons engaged in agriculture and for holders. Among non-Ghanaians engaged in agriculture, nationals of Togo (46.3%, 41.2%) and Burkina Faso (22.8%, 21.9%) constitute the highest proportion of those engaged in arable and tree crop cultivation respectively. The highest proportion of non-Ghanaians among persons engaged in livestock rearing are Burkinabes and that for those engaged in aquaculture are Nigerians (40.7%). A similar pattern is observed for holders.

13.1.12 Prevalence of disability in agricultural households

The proportion of persons in agricultural households with some form of disability is 1.1 percent for males as for females, with physical (38.3%) and sight (22.6%) disabilities being the most common. The proportion of persons with some form of disability among those engaged in agriculture is slightly higher (1.3%) than the proportion for the general household population. However, the common forms of disabilities are the same as those in the general agricultural household population. The proportion of holders who have some form of disability is the same as those in the general agricultural household but the proportion of female holders (1.4%) that have some form of disability is higher than males (1.0%) and the common forms of disability among holders are the same as in the general agricultural households. Persons engaged in forest tree cultivation have the highest proportion (2.2%) of persons with some form of disability while physical and sight remains the common forms of disability for all types of agriculture for both persons engaged and holders.

13.2 Land tenure arrangements

A total of 3,130,492 land parcels was used in the cultivation of arable crops, tree crops and forest trees and the common land tenure arrangements are ownership through freehold (52.2%) and inheritance (23.0%) followed distantly by share-cropping (8.9%) and renting (7.8%). Generally, majority (82.6%) of the parcels used by holders are not covered by any form of documentation irrespective of the type of tenure arrangement. Only about 13 percent of parcels have completed documentation. The proportion of parcels used for the cultivation of tree crops and forest trees that have completed documentation on the type of tenure arrangement is about twice as high as the proportion for arable crops.

13.3 Size of parcels

The majority of parcels of land (56.7%) under cultivation are small-scale, one-quarter (25.6%) are medium-scale, while 17.7 percent are large-scale. A higher proportion of parcels used by females (71.4%) than by males (51.7%) are small-scale in both urban and rural areas while the proportion of large-scale parcels used by males is about twice (20.7%) the proportion of females (8.7%).

The proportion of large-scale parcels under the cultivation of tree crops (22.6%) and forest trees (22.2%) are higher than that of arable crops (16.0%).

13.4 Ownership and use of agricultural equipment

The common types of agricultural equipment used by holders are knapsack (73.0%), tractor (24.7%) and mist blower (22.0%). However, only about one-third of holders owned knapsack, 3.4 percent owned mist blower and less than 1 percent owned other agricultural equipment. Generally, higher proportions of males than females owned and used agricultural equipment. Among those who owned equipment, 47 percent grow forest trees, 40.3 percent cultivate tree crops and 31.5 percent arable crops. Regardless of the sex of holder, there are no marked differences between ownership and use of agricultural equipment in both urban and rural areas.

Generally, very few livestock holders owned or used equipment associated with livestock rearing. The most common equipment associated with livestock rearing that is owned or used by livestock holders is the meat processing machine.

13.5 Household agricultural production

13.5.1 Fish production

The most common system used in the production of aquaculture is the monoculture from which about 96 percent of total metric tonnes of 18,134,477 mts were produced. Tilapia is the most produced fish constituting 99.8 percent of total quantity produced of which 82.1 percent was large-scale production. About 36 percent of total quantity of aquaculture produced is hatchery.

About 89 percent of total capture fisheries (430,455 mts) were landed by canoes and about 80 percent was landed by marine fishing. Anchovy (27.9%), cassava/croaker fish (17.4%) and herrings (13.9%) are the major marine fishes while tilapia (20.6%), hemichromis (15.9%) and heterotis (14.6%) are major inland fishes.

13.5.2 Crop production

The majority of arable crops holders (58.7%) are practicing mixed-cropping within which are holders of leafy vegetables (70.2%), starchy staples (61.9%) and non-leafy vegetables (53.0%).

Holders of industrial crops (72.7%), horticulture (72.5%), pulses/legumes (56.4%) and herbs/spices/condiments (50.6%) practice mono-cropping.

On average, about 27 percent of all arable crop holders use fertilizer while about 66 percent use pesticides. Horticultural crops (67.4%), non-leafy vegetables (58.3%) and herbs/spices (50.1%) are crops for which at least half of holders use fertilizer. The use of irrigation is among about 6 percent of arable crop holders with higher proportion among holders of non-leafy vegetables (31.4%) and leafy vegetables (25.2%) and least among holders of pulses/legumes (2.5%) and starchy staples (4.4%).

About 47 percent of arable crop holders produced for the primary purpose of 'sales with minor consumption' while about a quarter produced for the sole purpose of consuming their own produce.

A total of 29,019,363 mts of arable crops were produced of which staple crop constitute 94.4 percent. About half (49.9%) of the total arable crops produced were on a small-scale level while about a quarter was on large-scale production. In rural areas, 25.1 percent of all arable crops were produced on a large-scale compared to 50.9 percent produced on small-scale. In the urban areas, 29.3 percent of the quantity of arable crops was produced on a large-scale and 45.8 percent on small-scale.

About 97 percent of tree crop holders use the mono-cropping system in their production. Cocoa is the most dominant tree crop, engaging (80.9%) of holders (765,885) followed distantly by cashew (11.7%) and oil-palm (11.3%). About 42 percent of tree crop holders use fertilizer with a higher proportion of them among holders of rubber (55.7%), cocoa (49.7%) and pawpaw (49.6%). The proportion of tree crop holders that use pesticides is about 88 percent with a significantly higher proportion of holders (91.5%) cultivating cocoa using pesticides. The use of irrigation facilities in the production of tree crops is relatively low. Only 3.4 percent of tree crop holders use fully controlled irrigation and 4.9 percent use partially controlled irrigation.

The total quantity of tree crops produced was 4,316,450 of which about 61 percent were produced on large-scale. Oil-palm (1,517,327 mts; 35.2%) and cocoa (1,130,137 mts; 26%) together accounted for 68.6 percent of all the tree crop output. The proportion of cocoa produced on a large-scale is 70.1 percent.

13.5.3 Livestock production

Most holders (74.4%), especially those in the urban areas (83.1%), housed their livestock. About 53 percent of holders (324,698) are rearing the livestock for the primary purpose of 'sales and minor consumption'. The total livestock population is 17,709,547, with poultry forming the highest proportion (73.9%) followed by ruminants (21.2%). Goats are the most reared ruminant (49.8%), and for non-ruminants, pigs (both local and exotic) are the most reared (98.8%). A total of 228,629 of the 324,698 holders had other products from their livestock. A total of 96,329 of the holders are producing meat and 63,113 are producing eggs.

The total livestock off-take was 45 percent of the total livestock population (17,709,547) with the proportion of poultry off-take being the highest (47.7%). About 50 percent of livestock off-take was sales and 27.1 percent constitute livestock that has died. The proportion of livestock off-take that was sold in the urban areas (63.5%) was higher than in the rural areas (40.7%).

A total of 210,599 metric tonnes of meat was produced of which about 28 percent was from poultry and 51 percent from ruminants.

13.5.4 Forest tree production

Forestry Commission of Ghana classifies forest tree species by two dimensions: “Market Orientation” and “Policy Orientation”.

The number of holders who cultivate forest trees is 11,660 of which about 86 percent are in the rural areas. The common species cultivated are ofram (42.7%) and teak (22.8%). Cultivation of forest trees is mostly a male-dominated activity. Of the total holders who cultivate forest trees, 9,831 representing 84.3 percent are males.

A little less than four-fifth (76.9%) forest tree holders cultivate species classified as “Export and Domestic” while about one-third (32.3%) cultivate those classified as “Domestic only”. Holders in the rural areas cultivated 90 percent of the total 57,220,809 forest trees. Forest trees classified as “Domestic only” constituted about 77 percent of the total forest trees grown.

Among forest trees classified as “Domestic only”, acacia was grown the most and constituted about 97 percent of the Domestic only” category of trees. The next common forest trees grown were those classified as “Export and domestic” constituting about 19 percent of the total forest trees grown of which teak (49.6%), ofram (17.2%) and mahogany (10.1%) were the most common species of the “Export and domestic” forest trees classification.

13.6 Agricultural institutions

13.6.1 Characteristics of agricultural institutions

There are 16,919 agricultural institutions, 63.0 percent of which are in rural areas. Most of the institutions (60.9%) cultivate arable crops, about 30 percent grow tree crops and about 20 percent rear livestock. Agricultural institutions are the source of employment for 380,248 persons (63.7% males and 36.3% females) who were directly involved in agricultural activities of the institutions. Agricultural institutions also engaged a total of 174,636 farmhands.

13.6.2 Land tenure arrangements and documentation by agricultural institutions

As with the individual household holders, the dominant type of land tenure arrangement of the institution holders is ownership by freehold and inheritance in both urban and rural areas. This is true for arable and tree crops cultivation except for forestry where leasehold arrangements surpass inheritance generally. Again, most agricultural institutions, like the individual household holders do not have complete documentation on their land holding. Only one-third have completed the documentation on the land tenure arrangements on the parcels in use.

13.6.3 Ownership and use of equipment

The proportion of agricultural institutions that used agricultural equipment is more than twice the proportion that owned agricultural equipment. The tractor is the most used yet the least owned equipment. Hence, the proportion of institutions that use tractors is about 8 times the proportion that owned tractors whereas knapsack sprayer and mist blower are the agricultural equipment most institutions owned and used.

13.7 Agricultural production from institutions

13.7.1 Fish production by agricultural institutions

A total of 149 agricultural institutions are into aquaculture and about 80 percent of the institutions are in the rural areas. Monoculture is the common system of production that is used and about three-quarters of holders use ponds. More than half of the institutions that are into aquaculture produce grow-outs. A total of 39,095.5 mts of fish were produced with tilapia

constituting about two-thirds. The other fish species produced by institutions were catfish (23.4%), shrimp (7.7%) and heterosis (2.1%). About 95 percent of institutions in the urban areas were producing tilapia while about half of the institutions in the rural areas produced catfish.

There are 51 institutions in urban areas and 45 in rural areas that are engaged in capture fisheries. About 70 percent of the urban institutions are into marine fishing while 62 percent of the institutions in the rural areas are into inland fishing. Almost all the institutions engaged in capture fisheries use a canoe. The most used fishing gears are cast net and set net. A total of 54,317 mts of fish was landed of which about 64 percent was landed from canoes. The common marine species landed are tuna (52.7%), anchovy (27.0%), barracuda (10.2%) and herring (7.6%) while for inland fishing, 97.0 percent of fish landed was tilapia.

13.7.2 Crops production by agricultural institutions

Most of the agricultural institutions producing arable crops (81.9%) are into starchy staple crops. The major starchy staple crops institutions are producing are maize (40.1%), cassava (25.2%) and plantain (20.7%). In contrast to the individual household holders who mainly use the mixed type of cropping system, the majority of agricultural institutions use a mono-cropping system for the production of arable crops. Among both the individual household holders and the agricultural institutions cultivating tree crops, the mono-cropping system is used by the majority.

More than two-thirds (68.4%) of agricultural institutions engaged in arable crops do not use fertilizer. Also, only about 11 percent of institutions engaged in arable crop cultivation use irrigation. As with the individual holders, the most commonly used input by institutions engaged in arable crops is pesticides. Institutions cultivating horticultural crops (83.9%), non-leafy vegetables (75.4%) herbs/spices (75.1%) and starchy staples (70.2%) constitute the highest proportions that use pesticide.

The common system used by agricultural institutions engaged in tree crops is the mono-cropping system. Almost all institutions practised mono-cropping, namely, those engaged in the cultivation of avocado (97.4%), banana (97.3%), cashew (95.2%), and cocoa (93.0%). High proportions of institutions engaged in the cultivation of coffee (66.7%) and guava (50.0%) have nurseries.

About 86 percent of institutions that are engaged in tree crops use pesticides while only about 46 percent use fertilizer and about 13 percent use irrigation. Almost all institutions cultivating cocoa (91.3%), coffee (86.7%), rubber (85.7%) and cashew (82.1%) use pesticide. Institutions growing cocoa, about 62 percent, coffee about 40 percent, rubber about 52 percent and guava about 33 percent use fertilizer. A high proportion of tree crops cultivated by institutions that use irrigation were Pawpaw (41.7%), coffee (40.0%), and guava (33.3%).

About 70 percent of the 1,954,265 metric tonnes of arable crops produced were in rural areas. Institutions engaged in the cultivation of horticultural crops (49.5%), starchy staples (35.2%) and herbs/spices (13.8%) together produced 98.5 percent of the total quantity. The total tree crops produced by institutions was 503,282 of which about 86 percent were in rural areas. Oil-palm constituted about 76 percent of the total quantity of tree crops produced.

13.7.3 Livestock production

Nine in ten of the 3,272 institutions engaged in livestock rearing housed the livestock produce. Poultry (about 94%) and non-ruminants (about 93%) are the livestock housed the most by institutions. A total of 7,704,450 livestock were reared by institutions of which about 16 percent

were produced in the reference period. About 37 percent of the total livestock that institutions were rearing was off-take with a higher proportion in urban (53.6%) than rural areas (29.4%). About 79 percent of the off-take constituted quantity that was sold and about 17 percent constituted quantity that died. Non-ruminants and poultry had the highest proportion of off-take (39.7% and 38.0% respectively).

13.7.3 Forest tree production

The agricultural institutions engaged in forest tree production are 329 of which about 64 percent were in the rural areas. Most (about 81%) of the institutions engaged in the cultivation of forest trees cultivated forest trees classified as “Export only” and about 15 percent engaged in forest trees classified as “Domestic only”. A total of 3,319,077 forest trees were being grown by agricultural institutions and about 59 percent of the total number were grown by institutions in the urban areas. Teak (26.9%), eucalyptus (22.1%), ofram (11.6%) and cedrell (10.7%) which together constituted 71.3 percent were the major forest trees produced by institutions. A total of 1,633,957 forest tree seedlings were nursed by the agricultural institutions.

13.7.4 Total agricultural production (households and institutions)

In all, a total of 35,793,360 metric tonnes of arable and tree crops were produced of which about 93 percent were by individual household holders and only 7 percent by institutions. The total tree crops produced constituted about 13 percent of total crops production. A total of 60,539,846 forest trees were cultivated, of which production from individual household holders constituted about 96 percent. About 15 percent of total livestock (8,056,856) was produced by agricultural institutions.

CHAPTER FOURTEEN

CONCLUSION AND RECOMMENDATION

14.1 CONCLUSION

The average agricultural household size is far higher than that of the general population, although the age and sex composition of the agricultural household population is similar to the general structure of the Ghanaian population. Typically, an agricultural household comprises a nuclear family and some members of the extended family, and their population reside predominantly in rural areas. Marital union is near universal in agricultural households as almost all adults (36 years or older) have ever been married and majority are in union. In agricultural households, majority of the members do not have educational attainments beyond the basic level. Although majority of members of agricultural households are literate in at least one language, a significant proportion of them are literate in a Ghanaian language only.

In a typical agricultural household, those engaged are aging and majority of the youth (15-35 years) do not seem to consider agricultural activities as a viable source of employment as only few are working in the sector. Generally, agricultural activities are undertaken by holders with those engaged to support relatively few.

Agricultural activities in the country are mainly undertaken by Ghanaians and holders are mostly males. The proportion of persons with some form of disability within the sector is quite significant despite the rudimentary nature of agriculture.

Most agricultural holders are engaged in the cultivation of arable crops followed by tree crops and rearing of livestock. The agricultural sector is dominated by small-scale holders mostly among arable crop holders and those who produce on large-scale are mostly tree crops or forest tree cultivators.

Mechanised agriculture is low as the use of modern equipment such as tractors, shellers and meat processing equipment is lacking. Only few holders use tractors and an insignificant proportion own the tractors. Traditional methods of farming are predominantly practiced in the country compared to modern methods, with most holders depending on rain for cropping. The use of fertilizer is relatively low compared to pesticide, especially among tree crop holders. Knapsack sprayer and mist blower are tools mostly used by holders because majority of holders use pesticides.

The most common type of land tenure arrangement used by holders in the production of crops and forest trees is ownership through either freehold or inheritance. Few holders have completed documentation on the various types of tenure arrangement and this leads to insecurity of investment and hinders large scale mechanised production.

Majority of agricultural holders produce mainly for own consumption with minor sales. The situation is prevalent among arable crop holders compared to tree crop holders. The forest zone is the major hub for the production of arable and tree crops. Most arable crops are produced for the domestic market while tree crops are usually exported or used as inputs for local industry. Arable crops dominate the total quantity of crops produced and staple crops feature prominently in the types of arable crops produced. This indicates that, the type of arable crops produced are mostly what Ghanaians eat. The next highest in total output of agricultural production is tree crops of which oil palm, mostly used as inputs for industry, and cocoa dominate.

Poultry is the major type of livestock produced followed by ruminants. The mortality rate of livestock is unacceptably high and could make livestock rearing an unattractive venture.

Aquaculture holders mostly use ponds in the production of fish. Tilapia is the most cultured fish, but a large proportion of the harvest is not sold.

Similar to household holders, majority of agricultural institutions are into arable crops followed by tree crops and livestock mostly in rural areas except those into capture fisheries. The main type of land tenure arrangement made by institution for production is ownership either by freehold or inheritance but the proportion that have completed documentation covering the tenure arrangement is higher than the household holders.

Predominantly, institutions are engaged in large-scale production of arable and tree crops and higher proportions of their produce, in both urban and rural areas, are sold as compared to household holders.

Similar to household holders, most institutions engaged in aquaculture use the pond production system with marine fishing the major source for capture fisheries. Tilapia is the most cultured and captured fish by agricultural institutions.

Few of the institutions are engaged in livestock rearing. Those engaged rear mainly poultry and ruminants with poultry reared most by institutions. The proportion of livestock-offtake due to death is lower among institutions than among household holders.

14.2 RECOMMENDATION

Following from the findings and conclusions of the Ghana Census of Agriculture, these recommendations are proposed for consideration.

(a) *Promoting agriculture as a viable business among the youth,*

The full potentials of agriculture in employment, food security, foreign exchange earnings, wealth and investment outcomes are not being realised considering the current modes of operation and characteristics of the persons and institutions engaged in agriculture.

Agriculture should attract the youth, especially those with tertiary level education, among whom unemployment is high, and who the census shows have low participation in agriculture to promote diversity and complementarity. There is the need to:

- i. Address some issues, such as adoption of new technologies, low productivity in agriculture, lack of resources, etc., that have plagued the agriculture sector to attract more people and investments into agriculture;
- ii. Sensitize the youth to appreciate the viability of agriculture as a source of employment and livelihoods;
- iii. Encourage the youth with higher levels of education other than basic education to go into agriculture for their livelihood;
- iv. Support the youth to participate in modern agriculture practices, and agricultural enterprises along the value chain, including off-farm activities such as handling, processing, packaging and transportation;
- v. Adopt special programmes to build the capacity of the youth in agricultural operations; and
- vi. Facilitate the acquisition and documentation of land for agricultural purposes.

(b) Mainstreaming gender and disability issues in agriculture

Targeting women and persons with disability for special intervention will promote food and nutrition security, economic empowerment and general livelihood. There is the need to ensure that:

- i. Female agricultural holders are sensitized on the potential financial returns on investments in agriculture and trained in general business management;
- ii. The Ministry of Food and Agriculture collaborate with Agricultural Research Institutions, Financial institutions and the Ministry of Gender, Children and Social Protection to provide targeted support to women in agriculture; and
- iii. Persons with disability are resourced with disability-friendly agricultural tools, and specially designed financial packages.

(c) Enhancing production efficiency and yield in agriculture

Agricultural mechanisation and modernisation is key for sustainable food security and industrial growth. Some features of agriculture in Ghana—limited ownership and use of modern equipment, over reliance on rain, preponderance of small-scale farming, and farming on land without security of tenure—militate against its advancement. There is the need to:

- i. Commission a study to investigate and measure the yield per acre for all cropping systems and its effect on soil fertility;
- ii. Streamline land documentation process to make acquisition of documents less cumbersome and promote security in the land tenure agreements governing agriculture;
- iii. Establish mechanisation centres in all major agricultural areas to ensure access of different equipment along the value chain;
- iv. Ensure effective implementation of the yield improvement programme; and
- v. Reinvigorate extension services and promote appropriate and affordable and modern irrigation technologies.

(d) Diversifying agricultural production

Agricultural production is skewed towards the cultivation of arable crops with marginal concentration on cash crops, fisheries, livestock and forestry, making the agricultural sector potentially fragile. This highlights the need to:

- i. Institute extension services to sensitise and train holders on the production strategies and productivity of the various agriculture sub-sectors. This is particularly relevant for livestock rearing where high mortality threatens profitability of the venture;
- ii. Promote the nutritional, employment, food security, income generation benefits and foreign exchange earnings associated with the engagement in all the agriculture sub-sectors;
- iii. Make specially packaged and tailored agricultural inputs readily available for all the other agriculture sub-sectors;
- iv. Strengthen research for transformation by adopting modern production techniques, incubating innovations and combating disease infestation; and
- v. Promote the establishment of nurseries and the construction of culturing facilities (hatcheries, laboratories and fish feed mills).

(e) Improving agricultural value chain systems

The growth of the agricultural sector crucially depends on the coordination of activities of the various actors along the chain of production to consumption. This coordination will require both vertical and horizontal linkages of the various activities, which include, but not limited to producing, financing, transporting, storing, processing, and marketing. The coordination will engender predictability leading to stable and higher investments and profits. To achieve this level of coordination, there is the need to:

- i. Set up online and physical platforms for information exchange within and across the various levels and types of agricultural activities;
- ii. Facilitate business mentoring linkages between smallholder and commercial producers;
- iii. Institutionalise marketing of agricultural produce to make planning and predicting of the prospects of agriculture more reliable;
- iv. Develop market support services for selected horticulture, food and industrial crops to enhance production; and
- v. Develop agriculture insurance and financial products, especially long-term instruments.

(f) Enhancing use of agricultural statistics for policymaking

The production, harmonisation and accessibility of agricultural statistics is pivotal in designing and directing policy interventions for transformation and tracking progress. In view of this, conscious efforts and resources should be invested to ensure enhanced engagement with agricultural statistics. The occasioning of this engagement will require:

- i. Establishing the food and agriculture workstream of the Statistical Advisory Committee as directed by Clause 12(e) of the Statistical Service Act 2019, (Act 1003);
- ii. Promoting the development and use of metadata and harmonization of definitions, measurements and estimations;
- iii. Adhering to the conduct of agricultural census three years after the population census, as directed by Clause 35(2) of the Statistical Service Act 2019, (Act 1003);
- iv. Building capacity on the production and use of agricultural statistics;
- v. Enforcing the Weights and Measures Act 1975, (NRCD 326) to ensure fair and standardized pricing and Clause 23 of the Statistical Service Act 2019, (Act 1003) to ensure a coordinated data collection on agriculture; and
- vi. Organising agriculture seminars and fairs to provide opportunities for the presentation of papers to aid policy formulation.

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APPENDIX 1

FAO RECOMMENDED ESSENTIAL AND FRAME ITEMS

S/N	Essential Items	Frame Items
1	Identification and location of agricultural holding	Identification and location of agricultural holding
2	Legal status of agricultural holder (type of holder)	Main purpose of production of the holding
3	Sex of agricultural holder	Other economic activities of the household
4	Age of agricultural holder	Total area of holding
5	Main purpose of production of the holding	Use of irrigation on the holding
6	Other economic activities of the household	Types of temporary crops on the holding
7	Total area of holding	Types of permanent crops on the holding and whether in compact plantations
8	Area of holding according to land use types	Presence of nurseries
9	Area of holding according to land tenure types	Presence of cropped land under protective cover
10	Area of land actually irrigated	Number of animals
11	Area of temporary crop harvested (for each crop type)	Use of genetically modified seeds
12	Area of productive and non-productive permanent crop in compact plantations	Presence of aquaculture on the holding
13	Number of permanent crop trees in scattered plantings	Presence of woodland on the holding
14	Use of each type of fertilizer	Whether agroforestry is practised
15	Type of livestock system	Engagement of household members in fishing activities*
16	Number of animals	
17	Number of female breeding animals	
18	Use of agricultural pesticides	
19	Household size by sex and age groups	
20	Whether working on the holding is the main activity	
21	Working time on the holding	
22	Number and working time of employees on the holding by sex	
23	Presence of aquaculture on the holding	

Source: FAO, 2018. World Programme for the Census of Agriculture 2020. Volume 2: Detailed Operational Guidelines.

** Note that fisheries is outside the scope of the agricultural census but the engagement of household members in fishing activity is included in the list of frame items as it is suitable for countries considering a wider scope*

APPENDIX 2

EXPERT CONTRIBUTORS

Steering Committee

NAME	ORGANISATION	DESIGNATION
Hon. Dr. Owusu Afriyie Akoto	Minister for Food and Agriculture	Chair
Hon. Vincent Sowah Odotei (MP)	Deputy Minister, Ministry of Communications	Co-Chair
Prof. Samuel Kobina Annim	Government Statistician, Ghana Statistical Service	Member
Prof. N. N. N. Nsowah-Nuamah	Expert, Dominion University	Member
Dr. Grace Bediako	Ghana Statistical Service Board	Member
Mr. Baah Wadieh	Ghana Statistical Service	Member
Mr. Kwarteng-Amaning	Ministry of Finance	Member
Mr. Papa Kow Bartels	Ministry of Trade and Industry	Member
Mrs. Patricia Dovi Sampson	Ministry of Information	Member
Hon. Francis Ato Cudjoe (MP)	Deputy Minister, Ministry of Fisheries and Aquaculture Development	Member
Mr. Benjamin Koranteng Okyere	Ministry of Food and Agriculture	Executive Secretary

Secretariat

NAME	ORGANISATION	DESIGNATION
Mr. Francis Dzah	Ghana Statistical Service	Coordinator
Mr. Anthony Pharin	Ghana Statistical Service	Co-Coordinator
Mr. Sidney Nii Oko Bampoe Addo	Ministry of Food and Agriculture	Deputy Coordinator
Mr. Kwaku S. N. Djanie	Ghana Statistical Service	Administrator
Mr. David Kombat	Ghana Statistical Service	Member
Mrs. Araba Forson	Ghana Statistical Service	Member
Mr. Kofi Darko	Ministry of Food and Agriculture	Member
Mr. Harrison Opoku	Ministry of Food and Agriculture	Member
Mr. Owusu Kagya	Ghana Statistical Service	Member
Mrs. Bernice Ofosu-Baadu	Ghana Statistical Service	Member
Mrs. Mabel Appiah-Danso	Ghana Statistical Service	Member
Mr. Elliot Ansah	Ghana Statistical Service	Member
Mrs. Rebecca Laryea Addo	Ghana Statistical Service	Member

Data Processors

NAME	ORGANISATION
Mrs. Jacqueline Anum	Ghana Statistical Service
Mr. Kwamena Leo Akafra	Ghana Statistical Service
Mr. John Foster Agyaho	Ghana Statistical Service
Mr. Rochester Appiah Kusi	Ghana Statistical Service
Mr. Ernest Enyan	Ghana Statistical Service
Mrs. Samilia Mintah	Ghana Statistical Service
Ms. Sweta Pandey	Ghana Statistical Service
Mr. Yaw Misefa	Ghana Statistical Service

Editors

NAME	ORGANISATION
Prof. Frederick Ato Armah	University of Cape Coast
Dr. Michael Adu	University of Cape Coast
Ms. Nana Nyarko Boateng	Consultant, Gird Centre
Mr. Isaac Odoom	Ghana Statistical Service
Ms. Gloria Ama Akoto-Bamfo	Ghana Statistical Service
Mr. Robert Theophilous Kwami	Ghana Statistical Service
Mr. Omar Seidu	Ghana Statistical Service

Writers

NAME	ORGANISATION
Mr. George Emmanuel Ossei	Ghana Statistical Service
Mr. Anthony Krakah	Ghana Statistical Service
Mr. Francis Bright Mensah	Ghana Statistical Service
Mr. Emmanuel Boateng	Ghana Statistical Service
Mr. Solomon Owusu-Bempah	Ghana Statistical Service
Mr. Patrick Adzovor	Ghana Statistical Service
Mr. Emil Kpo	Ghana Statistical Service
Mr. Michael Beckoe	Ghana Statistical Service
Mr. Godwin Odei Gyebi	Ghana Statistical Service
Mrs. Augusta Okantey	Ghana Statistical Service
Mr. Justice Frimpong-Manso	Ministry of Food and Agriculture
Mr. Joseph Effah Ennin	Fisheries Commission
Mr. John Nortey	Ministry of Food and Agriculture
Mr. David Galley	Forestry Commission
Dr. Razak Okine	Ministry of Food and Agriculture
Mr. Abednego Pappoe	Fisheries Commission
Mr. Daniel Ninson	Ministry of Food and Agriculture

APPENDIX 3

QUESTIONNAIRES

GHANA STATISTICAL SERVICE

In collaboration with

Statistics, Research and Information Directorate, MOFA



REPUBLIC OF GHANA



GSS



MoFA



FAO

GHANA CENSUS OF AGRICULTURE
CORE MODULE HOUSEHOLD QUESTIONNAIRE
REFERENCE PERIOD: 2017 AGRICULTURAL SEASON

Note: Information collected will be treated confidential under PNDC Law 135

REGION NAME:CODE DISTRICT NAME: CODE
DISTRICT TYPE SUB-DISTRICT EA BASE NAME: EA No.
SERIAL NUMBER OF STRUCTURE SERIAL NUMBER OF ELIGIBLE HOUSEHOLD

CORE MODULE

SECTION 0: HOUSEHOLD INFORMATION

Min

Time started (24Hrs): Hr

1. EA Code: [][][][][][][][][][] (*CAPI will provide for confirmation)

2. Type of Locality: 1= Urban 2 = Rural: []

3. Serial number of Structure: [][][][]

4. Serial Number of eligible HH: [][][]

(*CAPI will provide for 3 & 4 for confirmation)

5. Ecological Zone: 1=Coastal; 2=Forest; 3=Savannah []

6. Locality Name: [][]

7. Locality Number: [][]

8. Name of Respondent: 9. Size of household: Male Female Total

(*CAPI will provide for total for confirmation)

[][][][][][][][][][]

10. Telephone number of Head or any member of the household: _____

SECTION 1: SOCIO-ECONOMIC CHARACTERISTICS OF HOUSEHOLD MEMBERS

HOUSEHOLD ROSTER: LIST OF ALL MEMBERS OF HOUSEHOLD

Household Member ID No	List names of usual household members (1)	What is (NAME's) sex (2)	What is the relationship of (NAME) to the head of the household? (3)	How old was (NAME) on his/her last birthday? (4)
	[START WITH HEAD OF HOUSEHOLD FOLLOWED BY SPOUSE(S), THEIR CHILDREN AND THEN OTHERS IN ORDER OF SENIORITY]	1=Male 2=Female	01 Head 02 Spouse (Wife/Husband) 03 Child (Son/Daughter) 04 Parent/Parent in-law 05 Son/Daughter in-law 06 Grandchild 07 Brother/Sister 08 Step child 09 Foster child 10 Other relative 11 Non-relative	RECORD IN COMPLETED YEARS ONLY
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				

SECTION 1: SOCIO- ECONOMIC CHARACTERISTICS OF HOUSEHOLD MEMBERS cont'd

Household Member ID No.	List names of usual household members (1)	Does (NAME) have any challenge with seeing, hearing, or moving that limits his/her full participation in normal/daily human activities? (5)	What is (NAME's) nationality? (6)	In what region of Ghana/Country/ Geographical region was (NAME) born? (7)	MEMBERS 11 YEARS OR OLDER	3 YEARS OR OLDER	3 YEARS OR OLDER	MEMBERS (12 YEARS OR OLDER)
					In what language can (NAME) read and write? (8)	Has [NAME] ever attended school or is [NAME] attending school now? (9)	What is/was the highest educational level attained by (NAME)? (10)	What is (NAME's) current marital Status? (11)
CAPI WILL PROVIDE		1= No difficulty 2= Yes, some difficulty 3= Yes, a lot of difficulties 4= Cannot (...) at all	SEE NATIONALITY CODE	Western.....01 Central.....02 Greater Accra.....03 Volta.....04 Eastern.....05 Ashanti.....06 Brong Ahafo.....07 Northern.....08 Upper East.....09 Upper West.....10 Other ECOWAS.....96 (Specify) Africa other than ECOWAS.....97 (Specify) Outside Africa.....98 (Specify)	1 None (not literate) 2 English only 3 Ghanaian language only 4 English and Ghanaian language 5 English and French 6 English, French and Ghanaian language 7 Other (Specify)	1= Never (>> 11) 2= Now 3= Past	Pre-school.....01 Primary.....02 JSS/JHS.....03 Middle.....04 SSS/SHS.....05 Secondary.....06 Voc/Tech/Comm.....07 Post Sec. Non-Tertiary....08 Tertiary.....09	1= Never married 2= Informal/consensual union/ living together 3= Married 4= Separated 5= Divorced 6= Widowed
01								
02								
03								
04								
05								
06								
07								
08								

NATIONALITY CODES

Ghanaian by birth.....1
Dual Nationality.....2
Ghanaian by naturalisation...3
Benin.....4
Burkina Faso.....5
Cameroun.....6
Cote d'Ivoire.....7
Gambia.....8
Guinea.....9
Guinea Bissau.....10
Liberia.....11
Mali.....12
Mauritania.....13
Niger.....14
Nigeria.....15
Senegal.....16
Sierra Leone.....17

SECTION 1: SOCIO-ECONOMIC CHARACTERISTICS OF HOUSEHOLD MEMBERS cont'd.

15 YEARS OR OLDER

Household Member ID No.	Which of the following Agricultural <u>Activities</u> was (NAME) engaged in?	Which of the activities in (12) was (NAME'S) MAIN occupation/activity?	How many hours did (NAME) work on the MAIN activity in (13) in a week?	What was (NAME's) non-agricultural activity(ies)?	What was (NAME's) Forestry activity(ies) other than tree planting (culturing of trees)?								
CAPI will provide	(12)	(13)	(14)	(15)	RECORD UP TO 5 ACTIVITIES (16)								
	A. Arable crop farming B. Tree crop farming C. Livestock rearing D. Aquaculture (Fish farming) E. Forestry (Tree planting) F. Bee keeping G. Capture fisheries H. None >> 15 if H (None) (MULTIPLE CHOICE)	1. Arable crop farming 2. Tree crop farming 3. Livestock rearing 4. Aquaculture (Fish farming) 5. Forestry tree planting 6. Bee keeping 7. Capture fisheries	RECORD IN COMPLETE HOURS. APPROXIMATE TO THE NEAREST HOUR	A=Industry B=Services C=None	A. Hunting B. Herbal collection C. Crafts D. Gathering of other non-timber forest products (e.g. Shea nut) E. Logging F. Charcoal burning G. Collection of wood fuel (firewood and sawdust) H. None (Multiple choice)								
	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td> </tr> </table>	A	B	C	D	E	F	G	H				
A	B	C	D	E	F	G	H						
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	<table border="1" style="width: 100%; text-align: center;"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>												

SECTION 1: SOCIO-ECONOMIC CHARACTERISTICS OF HOUSEHOLD MEMBERS (15 YEARS OR OLDER) cont'd.[illegible]

SECTION 2: HOLDER INFORMATION

Household Member ID No.	Serial number and name of farms (parcels) on holding	What was the <u>land tenure</u> type of farm (parcel) on holding?	Did (NAME) have documentation for the type of tenure?	What was the area (size) of farm (parcel) according to land tenure type?	In which District was this farm (parcel) located (REFER TO DISTRICT CODES)	How many persons were engaged (land preparation, planting, clearing of weeds, harvesting etc.) on each farm (parcel) (both paid and unpaid) for 2017 cropping season?			Of the number of persons engaged, how many were paid in 2017? RECORD '0' IF NO ONE WAS PAID If "0" >> (12)			How many hours did a paid person work on each farm (parcel) per week?	Total number of fields (plots) on each farm (parcel) (12)	What was the legal status of the holder?	Is the legal status type of the holder's holding formalised or registered?	
(1)	(2)	(3)	(4)	(5)	((8)	(9)			(10)			(11)	(12)	(13)	(14)	
CAPI will provide	ASSIST THE RESPONDENT TO PROVIDE NAMES FOR ALL THE PARCELS ON HOLDING	1 = Own/Freehold 2 = Leasehold 3 = Renting 4 = Share cropping 5 = Squatting 6 = Inheritance 7 = Trusteeship 8 = Other Specify.....	1 = Yes, complete 2 = Yes partial 3 = No now Processing 4 = Not at all	RECORD THE UNIT OF MEASURE USED IN THE COMMUNITY E.g. 1 = Pole 2 = Rope 3 = Metres 4 = Acre 5 = Hectare								RECORD IN HOURS.	FOR EACH TYPE OF FARM (PARCEL), RECORD THE NUMBER OF FIELDS (PLOTS) ±	1= Individual 2= Joint within same household 3= Joint across different households	1= Yes 2 = No	
	No. Name			size Unit			TOTAL	MAL E	FEMALE	TOTAL	MA LE	FEMALE				
01	1															
	2															
02	1															
	2															

TRANSFER NAMES OF HOLDERS (THOSE WHO ANSWERED YES TO QUESTION 20 ON PAGE 6 TO THIS PAGE WHILE MAINTAINING THEIR ROW. **(15 YEARS OR OLDER)**)

SECTION 3: TYPES OF ARABLE CROPS ON FIELD (PLOT)

[illegible]

SECTION 3: TYPES OF ARABLE CROPS ON FIELD (PLOT) cont'd

[illegible]

- | <u>CROPS CODE</u> | <u>VEGETABLES</u> |
|--------------------------------|-----------------------------|
| <u>ARABLE CROPS</u> | 038 Asian vegetables |
| <u>STARCHY STAPLE</u> | 039 Cabbage |
| 001 Maize | 040 Carrots |
| 002 Rice | 041 Garden eggs |
| 003 Millet | 042 Lettuce |
| 004 Sorghum | 044 Stringed Beans |
| 005 Cassava | 045 Okro |
| 006 Yam | 046 Pepper (Sweet) |
| 007 Cocoyam | 047 Cucumber |
| 008 Taro | 048 Spring Onions |
| 009 Sweet potato | 049 Tomato |
| 010 Plantain | 050 Onions |
| <u>PULSES / LEGUMES</u> | 051 Shallots |
| 011 Bambara beans | |
| 012 Cowpeas | <u>TREE CROPS</u> |
| 013 Groundnuts | 052 Avocado |
| 014 Pigeon peas | 053 Banana |
| 015 Soya bean | 054 Cashew |
| <u>HERBS, SPICES</u> | 055 Cocoa |
| <u>& CONDIMENTS</u> | 056 Coconut |
| 016 Black pepper | 057 Coffee |
| 017 Ginger | 058 Cola |
| 018 Nutmeg | 059 Citrus |
| 019 Garlic | 060 Mango |
| 020 Pepper (Hot) | 061 Oil-palm |
| 021 Melon Seeds (Agusi) | 062 Guava |
| <u>HORTICULTURE</u> | 063 Pawpaw |
| 022 Flowers | 064 Shea-nut |
| 023 Pineapples | |
| 024 Watermelon | <u>INDUSTRIAL</u> |
| 025 Passion Fruit | 065 Citronella |
| 026 Sweetop | 066 Cotton |
| 027 Soursop | 067 Jute |
| 028 Butternut squash | 068 Kenaf |
| <u>LEAFY VEGETABLES</u> | 069 Rubber |
| 029 Gboma | 070 Sissal |
| 030 Bitter leaf | 071 Sweet Berry |
| 031 Amaranthus | 072 Sugar Cane |
| 032 Spinach | 073 Tobacco |
| 033 Pumpkin leaves | |
| 034 Moringa | <u>ORNAMENTALS</u> |
| 035 Ayoyo/ Ademe | 074 Flowers |
| 036 Cocoyam leaves | 075 Grasses |
| 037 Mushroom | 076 Leaves |
| <u>UNITS</u> | 077 Landscaping |
| 01 Kg | |
| 02 Tonnes | |
| 03 Mini Bag (Fertilizer ba | <u>CROPPING CODE</u> |
| 04 Maxi Bags (Cocoa bag | 1= MONO |
| 05 Tubers | 2= MIXED |
| 06 Bundle/ Bunch/ Heap | |
| 07 Single Count | |
| 08 Rope | |
| 09 Pole | |
| <u>Units for (7)</u> | |
| 1= bag maxi | |
| 2= bag mini | |
| 3= bowl | |
| 4= bucket | |
| 5= basket | |
| 6=bunch | |
| 7=tubers | |

SECTION 4: LIVESTOCK

[illegible]

CODE OF

ANIMAL
LIVESTOCK

- 101 Ghana shorthorn cattle
- 102 Sanga cattle
- 103 N'Dama cattle
- 104 White Fulani
- 105 Gudali
- 106 Exotic cattle
- 107 Crosses
- 108 Zebu cattle
- 109 Other cattle
- 110 Horse
- 111 Donkey
- 112 Mule
- 113 Local Pig
- 114 Exotic Pig
- 115 Sahelian Goat (long legged)
- 116 West African Dwarf Goat (WAD)
- 117 Djallonke Sheep
- 118 Sahelian Sheep (long legged)
- 119 Dog
- 120 Cat
- 121 Other (Specify)
- POULTRY & BARN-YARD**
- 221 Local chicken (Indigenous)
- 222 Chicken Layers
- 223 Chicken Broilers
- 224 Cockerel
- 225 Exotic chicken (crosses)
- 226 Guinea fowl
- 227 Duck
- 228 Goose
- 229 Ostrich
- 230 Turkey
- 231 Pigeon
- 232 Quail
- 233 Other (Specify)

NON

TRADITIONAL

334 Honey bee (Bee keeping)
335 Snail
336 Grass cutter
337 Rabbit
338 Other (Specify)

01. Kg
02. Gallons
03. Jerrycans
04. Litres
05 Single count
06 Crates of Eggs 07 Packs of 12 singles

SECTION 4: LIVESTOCK cont'd

[illegible]

SECTION 5: AQUACULTURE

[illegible]

AQUACULTURE
CODE

AQUACULTURE

SPECIESTYPE

201 Tilapia
202 Clarias
(Catfish)

203 Shrimp
204 Crabs
205 Heterotis
206 Other
(Specify)

<u>TYPE</u>	<u>OF</u>
<u>HOLDING</u>	
<u>FACILITY</u>	

1 Pond
2 Cage

3 Dam/ Reservoir
4 Dug-out
5 Tank

UNITS

01 m³
02 m²

TYPE OF WATER
(MEDIUM)

001 Salt water
002 Brackish/
Estuarine water

INSTITUTIONS
EPA =
Environmental
Protection
Agency

WRC = Water
Resources
Commission

FC = Fisheries
Commission

SECTION 6: FORESTRY

[illegible]

AGRO-
FORESTRY
TREE
CODES

FOREST
TREES

301 Wawa
302 Watapuo
303 Teak
304 Potrodom
305 Ofram
306 Mansonia
307 Kusia
308 Kokrodua
309 Emeri
310 Bombax
311
Awiemfosamina
312
Mahogany
313 Acacia
314 Iroko
315 White
Wood
316 Kapok
317Neem
Tree
318 Cedrella
319 Gmelina
320 Odum
321 Makore
322
Eucalyptus
323 Ceiba
324 Apro
325 Utile
326 Hyedua
327 Edinam
328 Sapele
329 Kyenkyen
330 Other
(Specify)

SECTION 7: CAPTURE FISHERIES (MARINE & INLAND FISHING)

Household Member ID No.	Which subsector of capture fisheries did (NAME's) activities fall in? 1= Marine capture fisheries 2= Inland capture fisheries (fresh water) 3= Both	What fishing Vessel did (NAME) use in 2017 1= Canoe 2= Semi-industrial vessel 3=Both IF "2">> Q10	What is the status of Canoe ownership? RECORD THE NO. OF CANOES USED BY HOUSEHOLD MEMBER	What was the number of (NAME's) Canoe(s) registered as at December 2017?	What was the Number of (NAME's) Canoe(s) embossed as at December 2017?	Did (NAME) use an engine on the canoe(s)? 1=Yes 2=No IF "NO" & Q2=1>> Q15 BUT IF "NO"& Q2=3>> Q10	What is the make (brand) of the engine used on the Canoe(s)?	What is the capacity of the engine used (Hp) on the Canoe(s)?	Did (NAME) readily get premix fuel anytime needed? 1=Yes 2=No IF Q2=1>> 15	What was the status of the Semi-industrial Vessel ownership? RECORD THE NO. OF SEMI-INDUSTRIAL VESSELS USED BY HOUSEHOLD MEMBER	What was the number of (NAME's) Semi-industrial vessel(s) registered as at December 2017?	Number of (NAME's) Semi-industrial vessel(s) embossed as at December 2017?	What is the make (brand) of the engine used on the Semi-industrial Vessel(s)?	What is the capacity of the engine used on the Semi-industrial Vessel(s)?	Which fishing gear(s) did (NAME) use in 2017? USE GEAR CODE	What was the number of fishing trips per week	How many hours did (NAME) spend on each trip?	Did (NAME) and crew migrate to other regions to fish? 1=Y 2=N o											
																			(3)				(10)				(15)		
																			A	B	C	D	A	B	C	D	A	B	C
CAPI WILL PROVIDE	(1)	(2)		(4)	(5)	(6)	(7)	(8)	(9)		(11)	(12)	(13)	(14)		(17)	(18)	(19)											
			Fully Owned Hired Jointly Owned Free Use																										

- GEAR CODE**
001 Purse seine
(Poli/Watsa)
002 Hook & Line
003 Drift Gill Net
004 Beach Seine
005 Ali
006 Set Net and
007 Cast net
008 Nifa-nifa
009 Atigya
010 Bamboo
011 Traps
012 Other (specify)
- ENGINE MAKE**
001 Yamaha
002 Suzuki
003 Johnson
004 Tohatsu
005 Man Diesel
006 Sale Diesel
007 Daihatsu
008 Yanmar
009 Hyundai
010 Vehicle Engine
011 Other (specify)
- ENGINE CAPACITY**
001 – 4HP
002 – 8HP
003 – 9HP
004 – 15HP
005 – 25HP
006 – 30HP
007 – 40HP
008 – Other (Specify)
- UNIT OF MEASUREMENT**
001 – Pan/Basin
002 – Basket
003 – Bucket
004 – Crate
005 – Kg
006 – Carton
007 – Other (Specify)
- Marine Species**
001= Anchovy
002= Atlantic sailfish
003= Barracuda
004= Bigeye Fish
005= Blue Marlin
006= Bonito
007= Bumper
008= Buro
009= Burrito
010= Butter Fish
011= Cassava/Croaker
012= Crabs
013= Decapterus (Pamplo)
Dentex (Bala)

SECTION 7: CAPTURE FISHERIES (MARINE & INLAND FISHING)

Household Member ID N0	Fish Capture (Landings)																Total cost incurred in 2017.		What is the main purpose of this Activity? (22)									
																	(21A)	(21B)										
CAP I WIL L PRO VID E	What are the major species of fish (NAME) or crew caught / landed in 2017? (19)					Total quantity caught (landed) and quantity sold in 2017 (20)											Labour (security, payment to crew etc.)	Fuel, Food, Ice, Bait, maintenance costs)	1= Own consumption only 2 Own consumption with minor sales 3= Sales only 4= Sales with minor consumption									
						A				B				C						D				E				
	A	B	C	D	E	Quantity Captured	Quantity Sold	Unit of measurement	Price per unit (GHC)	Quantity Captured	Quantity Sold	Unit of measurement	Price per unit (GHC)	Quantity Captured	Quantity Sold	Unit of measurement				Price per unit (GHC)	Quantity Captured	Quantity Sold	Unit of measurement	Price per unit (GHC)	Quantity Captured	Quantity Sold	Unit of measurement	Price per unit (GHC)

- 014= , Yeke, Tsile)
 015= Dolphin Fish
 016= Drum
 017= Flying Fish
 018= Flying Gurnard
 019= Garfish
 020= Globefish
 021= Grouper
 022= Guitarfish
 023= Halfbleak
 024= Kingfish (Saflo)
 025= Ladyfish/Tenpounder
 026= Lobster
 027= Herring
 028= Mackerel (Salmon)
 029= Meagre
 030= Moonfish
 031= Mullet
 032= Palometa (Lilee)
 033= Pampano (Kokobli)
 034= Ray
 035= Red Pandora (Yiyiwa)
 036= Ribbonfish
 037= Roncador
 038= Sardinella
 039= Sea Snail
 040= Seabream (Sikasika)
 041= Shad/Bonga
 042= Sharks
 043= Shrimps
 044= Snapper
 045= Soles
 046= Spade Fish (Okposansa)
 047= Swordfish
 048= Threadfin
 049= Triggerfish
 050= Tuna
 051= Other (specify)
- Inland Species**

- 001= Alestes
 002= Aucheno glanis
 003= Bagrus
 004= Brycinus nurse
 005= Chrysichthys
 006= Citharinus
 007= Clarias
 008= Cynothrissa
 009= Distichodus
 010= Gymnarchus
 011= Hemichromis
 012= Heterotis
 013= Hydrocynus
 014= Labeo
 015= Lates
 016= Malapterurus elec.
 017= Mormyridae
 018= Polypterus spp
 019= Sarotherodon galilaeus
 020= Schilbeidae
 021= Synodontis
 022= Tilapia (Oreochromis)
 023= Other (specify)

SECTION 8: TYPES OF TREE CROPS ON FIELD (PLOT)

Household Member ID No.	Serial number of farms (Parcels) on holding	Serial number of fields (plots) on each farm (parcel)	Total land area of this field (plot)? (1)	Type of cropping system 1= mono cropping 2= mixed cropping (2)	Type of Tree Crops produced on this field (plot) (3)	Production																What was the total cost of production in 2017					
						What was the total quantity produced and quantity sold in 2017 (SEE UNITS: IF THE RESPONDENT MENTIONED A UNIT THAT IS NOT SPECIFIED, HELP THE RESPONDENT TO CONVERT TO ONE OF THE SPECIFIED UNITS AS THE NEAREST EQUIVALENT) (4)																(5A)	(5B)				
						A				B				C				D									
CAPI TO PROVIDE			<u>Units</u> 1 = Pole 2 = Rope 3 = Metres square 4 = Acre 5 = Hectares		SEE CROP CODES. [RECORD UP TO 4 CROPS IF MIXED CROPPING]	A	B	C	D	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Labour	Other input cost
						ARE A	UNI T																				

- CROPS CODE**
- ARABLE CROPS**
- STARCHY STAPLE**
- 001 Maize
002 Rice
003 Millet
004 Sorghum
005 Cassava
006 Yam
007 Cocoyam
008 Taro
009 Sweet potato
010 Plantain
- PULSES / LEGUMES**
- 011 Bambara beans
012 Cowpeas
013 Groundnuts
014 Pigeon peas
015 Soya bean
- HERBS, SPICES & CONDIMENTS**
- 016 Black pepper
017 Ginger
018 Nutmeg
019 Garlic
020 Pepper (Hot)
021 Melon Seeds (Agusi)
- HORTICULTURE**
- 022 Flowers
023 Pineapples
024 Watermelon
025 Passion Fruit
026 Sweetsop
027 Soursop
028 Butternut squash
- LEAFY VEGETABLES**
- 029 Gboma
030 Bitter leaf
031 Amaranthus
032 Spinach
033 Pumpkin leaves
034 Moringa
035 Ayoyo/ Ademe
036 Cocoyam leaves
037 Mushroom
- UNITS**
- 01 Kg
02 Tonnes
03 Mini Bag (Fertilizer bag)
04 Maxi Bags (Cocoa bag)
05 Tubers
06 Bundle/ Bunch/ Heap
07 Single Count
08 Rope
09 Pole
- Units for (7)**
- 1= bag maxi
2= bag mini
3= bowl
4= bucket
5= basket
6 =bunch
7 =tubers

SECTION 8: TYPES OF TREE CROPS ON FIELD (PLOT) cont'd

Household Member ID No.	Serial number of farms (parcels) on holding	Serial number of field (plot) on holding	What was the main purpose of producing each crop type on this field (plot) (6)	Did (NAME) use pesticide (weedicide, insecticide, fungicide, etc) on this field (plot)? (7)	Did (NAME) use fertilizer on this field (plot)? (8)	Did (NAME) have nurseries on this field (plot)? (9)	What was the main source of planting material (NAME) used for this production? (10)	Did (NAME) irrigate this field (plot)? (11)
CAPI WILL PROVIDE			1= Own consumption only 2= Own consumption with minor sales 3= Sales only 4= Sales with minor consumption	1=Yes 2=No	1=Yes 2=No	1=Yes 2=No	1= Shop 2= Own produce 3= Gifts 4= Open market 5= Seed Production Division (COCOBOD) 6= Department of Agriculture 7= Other (specify)	1=Yes, fully controlled 2=Yes, partially controlled 3=No
			A B C D					

VEGETABLES

038 Asian vegetables
039 Cabbage
040 Carrots
041 Garden eggs
042 Lettuce
044 Stringed Beans
045 Okro
046 Pepper (Sweet)
047 Cucumber
048 Spring Onions
049 Tomato
050 Onions
051 Shallots

TREE CROPS

052 Avocado
053 Banana
054 Cashew
055 Cocoa
056 Coconut
057 Coffee
058 Cola
059 Citrus
060 Mango
061 Oil-palm
062 Guava
063 Pawpaw
064 Shea-nut

INDUSTRIAL

065 Citronella
066 Cotton
067 Jute
068 Kenaf
069 Rubber
070 Sissal
071 Sweet Berry
072 Sugar Cane
073 Tobacco

ORNAMENTALS

074 Flowers
075 Grasses
076 Leaves
077 Landscaping

CROPPING CODE

1= MONO
2= MIXED

SECTION 9: BEE KEEPING

[illegible]

SECTION 9: BEE KEEPING cont'd

[illegible]

Time taken to complete Hr

--	--

 Min

--	--

CONTROL

Enumerator's Name: Code:

--	--	--

 Date Started:

--	--	--	--	--	--

 Date Completed:

--	--	--	--	--	--

Signature:

Supervisor's Name: Code:

--	--	--

 Date Checked:

--	--	--	--	--	--

 Signature:

ANY SUPPLEMENTARY QUESTIONNAIRE USED? 1 = YES, 2 = NO

--

--

IF YES, INDICATE THIS QUESTIONNAIRE AS OF

--	--	--	--	--	--

GHANA STATISTICAL SERVICE

In collaboration with
Statistics, Research and Information Directorate, MOFA



REPUBLIC OF GHANA



GSS



MoFA



FAO

GHANA CENSUS OF AGRICULTURE 2016-2019

CORE MODULE INSTITUTIONAL/ COMMERCIAL QUESTIONNAIRE

REFERENCE PERIOD: 2017 AGRICULTURAL SEASONS

Note: Information collected will be treated confidential under PNDC Law 135

NAME OF INSTITUTION:

POSTAL ADDRESS:..... E-MAIL ADDRESS:

TELEPHONE NUMBER(S):GPS COORDINATES OF INSTITUTION: LONG:..... LAT:.....

ALT.....

REGION NAME:..... CODE DISTRICT NAME:..... CODE

DISTRICT TYPE ☐ SUB-DISTRICT ☐ EA BASE NAME:.....EA No.

INSTITUTIONAL/ COMMERCIAL MODULE

Time started (24Hrs): Hr

--	--

--	--

1. EA Code:

--	--	--	--	--	--	--	--	--	--

2. Type of Locality: 1= Urban 2 = Rural:

--

3. Serial number of Structure:

--	--	--

3. Agro Ecological Zone: 1=Coastal; 2=Forest; 3=Savannah

--

4. Locality Name: 5. Locality Number:

--	--	--

6. Name of Respondent:..... Position:

7. Number of workers: Male..... Female..... Total

8. Number of management staff: Male Female:Total:.....

9. Number of farm hands including supervisors: Male:.....Female:: Total:

SECTION 1: GENERAL CHARACTERISTICS

[illegible]

SECTION 2: ORGANISATIONAL INFORMATION

[illegible]

CROPS CODE

SECTION 3: TYPES OF CROPS ON PLOT

Serial number of parcels (farms) on holding	Serial number of plot(s) on holding	Type of cropping on holding 1= mono cropping 2= mixed cropping (1)	ARABLE AND TREE CROPS																Total cost of production in the reference period (SEE LIST OF COST CENTRES IN MANUAL) (4)							
			Type of crops produced on this plot (2)	Total quantity produced during the reference period (PROVIDE UNITS) (3)																						
				SEE CROP CODES. [RECORD UP TO 4 CROPS IF MIXED CROPPING]				A				B				C				D				A	B	C
		(USE CROPPING CODE TO DESCRIBE THE TYPE OF PLOT. SEE CROPPING CODES)	A	B	C	D	Quantity Produced	Unit of measurement	Price per Unit	Quantity Sold	Quantity Produced	Unit of measurement	Price per Unit	Quantity Sold	Quantity Produced	Unit of measurement	Price per Unit	Quantity Sold	Quantity Produced	Unit of measurement	Price per Unit	Quantity Sold	Value in Gh¢	Value in Gh¢	Value in Gh¢	Value in Gh¢

- ARABLE CROPS**
STARCHY STAPLE
001 Maize
002 Rice
003 Millet
004 Sorghum
005 Cassava
006 Yam
007 Cocoyam
008 Taro
009 Sweet potato
010 Plantain
PULSES / LEGUMES
011 Bambara beans
012 Cowpeas
013 Groundnuts
014 Pigeon peas
015 Soya bean
HERBS, SPICES & CONDIMENTS
016 Black pepper
017 Ginger
018 Nutmeg
019 Garlic
020 Pepper (Hot)
021 Melon Seeds (Agusi)

HORTICULTURE
022 Flowers
023 Pineapples
024 Watermelon
025 Passion Fruit
026 Sweetsop
027 Soursop
028 Butternut squash
LEAFY VEGETABLES
029 Gboma
030 Bitter leaf
031 Amaranthus
032 Spinach
033 Pumpkin leaves
034 Moringa
035 Ayoyo/ Ademe
036 Cocoyam leaves
037 other (specify)

Unit code for (4)

- 1= pole
2= rope
3= meters square
4= acre
5= hectare

SECTION 3: TYPES OF CROPS ON PLOT cont'd

[illegible]

CROPS CODE

ARABLE CROPS
STARCHY STAPLES

001 Maize
002 Rice
003 Millet
004 Sorghum
005 Cassava
006 Yam
007 Cocoyam
008 Taro
009 Sweet potato
010 Plantain

PULSES / LEGUMES

011 Bambara beans
012 Cowpeas
013 Groundnuts
014 Pigeon peas
015 Soya bean

HERBS, SPICES

CONDIMENTS

016 Black pepper
017 Ginger
018 Nutmeg
019 Garlic
020 Pepper (Hot)
021 Melon Seed
(Agusi)

HORTICULTURE

022Flowers
023Pineapples
024 Watermelon
025Passion Fruit
026Sweetsop
027Soursop
028Butternut squash

LEAFY VEGETABLE

029 Gboma
030 Bitter leaf
031 Amaranthus
032 Spinach
033 Pumpkin leaves
034 Moringa
035 Ayoyo/ Ademe
036 Cocoyam leaves
037 other (specify)

VEGETABLES

VEGETABLES
038 Asian vegetables
039 Cabbage
040 Carrots
041 Garden eggs
042 Lettuce
044 Stringed Beans
045 Okro
046 Pepper (Sweet)
047 Cucumber
048 Spring Onions
049 Tomato
050 Onions
051 Shallots

TREE CROPS

052 Avocado
053 Banana
054 Cashew
055 Cocoa
056 Coconut
057 Coffee
058 Cola
059 Citrus
060 Mango
061 Oil-palm
062 Guava
063 Pawpaw
064 Shea-nut

INDUSTRIAL

065 Citronella
066 Cotton
067 Jute
068 Kenaf
069 Rubber
070 Sissal
071 Sweet Berry
072 Sugar Cane
073 Tobacco

ORNAMENTALS

074 Flowers
075 Grasses
076 Leaves
077 Landscaping

CROPPING CODE

1= MONO
2= MIXED

SECTION 4: LIVESTOCK cont'd

[illegible]

SECTION 5: AQUACULTURE

Household Member ID No.	Serial number of aquaculture farms (parcels) on holding	Serial number of field/plots (holding facility) on farm (parcel)	Type of culture 1= Monoculture 2= Poly-culture 3= Integrated (1)	Production																		Total cost of production		Type of holding facility and medium of culture (6)	What is the main purpose of producing this type of specie? (7)	Which of the following institutions was (NAME) registered with? (8)								
				Type of species cultured (2)	Total quantity produced and sold (In Kg) (3)															Production Type for each specie in (2) 1 = Hatchery (Fingerlings) 2 = Grow-Out 3 = Both (4)		(5A)	(5B)											
					A			B			C			D			E			Labour	Other input cost e.g. feeding, medication, veterinary services, housing maintenance etc.	Holding Facility	Type of water (Medium)				1= Own consumption only 2= Own consumption with minor sales only 3= Sales only 4= Sales with minor consumption	A= EPA B = WRC C = FC D= None						
A	B	C	D	E	Qty Produced	Qty Sold	Selling Price per kg (GHC)	Qty Produced	Qty Sold	Selling Price per kg (GHC)	Qty Produced	Qty Sold	Selling Price per kg (GHC)	Qty Produced	Qty Sold	Selling Price per kg (GHC)	Qty Produced	Qty Sold	Selling Price per kg (GHC)					A	B	C		D	E					

AQUACULTURE CODE

AQUACULTURE SPECIESTYPE

201 Tilapia
202 Clarias (Catfish)
203 Shrimp
204 Crabs
205 Heterotis
206 Other (Specify)

TYPE OF

HOLDING FACILITY

1 Pond
2 Cage
3 Dam/ Reservoir
4 Dug-out
5 Tank

UNITS

01 m³
02 m²

TYPE OF WATER (MEDIUM)

001 Salt water
002 Brackish/ Estuarine water
003 Fresh water

INSTITUTIONS

EPA = Environmental Protection Agency

WRC = Water Resources Commission

FC = Fisheries Commission

SECTION 6: FORESTRY

Serial number of parcels on holding	Serial number of tree plot on holding	What is the type of cropping on this plot? 1= mono cropping 2= mixed cropping (1)	FORESTRY ONLY												
			What is the type of forest tree(s) on this plot? (2)	What was the total number of tree(s) on this plot at the start of the reference year? (3)	What is the total land area of tree plot on holding? (subjective) (4)	Do you have nurseries for forest tree plot on holding? (5)	What is the main purpose for producing these type of trees? (6)	Do you use fertilizer on this plot or part of it? (7)	What was the total number of forest tree(s) on this plot at the end of the reference year? (8)	Total number of trees sold in the year? (9)			Total cost of production (e.g fertilizer, seedlings, labour, etc) (10)		
CAPI WILL PROVIDE...			(USE FOREST TYPE CODE TO DESCRIBE THE TYPE OF PLOT ON HOLDING [SEE AGRO-FORESTRY TREE CODES. RECORD UP TO 5, IF MIXED TREES SEE FOREST TYPE CODE	(6) RECORD THE NUMBER ACCORDING TO THE SPECIES LISTED IN (3)	RECORD IN HECTRES		1=Yes 2=No	1= Own consumption only 2 Own consumption with minor sales 3= Sales only 4= Sales with minor consumption	1 = Yes, all 2 = Yes, partly 3 = No		Qty sold	Price per unit	Total value (Ghc)		
					AREA	UNITS									
			A B C D	A B C D E											

AGRO-FORESTRY TREE CODES

- TREES
 301 Wawa
 302 Watapuo
 303 Teak
 304 Potrodom
 305 Ofram
 306 Mansonia
 307 Kusia
 308 Kokrodua
 309 Emeri
 310 Bombak
 311 Awiemfosamina
 312 Mahogany
 313 Acacia
 314 Iroko
 315 White Wood
 316 Kapok
 317 Nim Tree
 318 Cedrella
 319 Gmelina
 320 Other (Specify)

TYPE OF FOREST

- 1= Mono
 2= Mixed

- UNITS
 211 m³
 212 m²/ Ha
 213 g
 214 kg

SECTION 7: CAPTURE FISHERIES (MARINE & INLAND FISHING)

Household Member ID No.	Which subsector of capture fisheries did (NAME's) activities fall in? 1= Marine capture fisheries 2= Inland capture fisheries (fresh water) 3= Both	What fishing Vessel did (NAME) use in 2017 1= Canoe 2= Semi-industrial vessel 3=Both IF "2">> Q10	What is the status of Canoe ownership? RECORD THE NO. OF CANOES USED BY HOUSEHOLD MEMBER	What was the number of (NAME's) Canoe(s) registered as at December 2017?	What was the Number of (NAME's) Canoe(s) embossed as at December 2017?	Did (NAME) use an engine on the canoe (s)? 1=Yes 2=No IF "NO" & Q2=1>> Q15 BUT IF "NO"& Q2=3>> Q10	What is the make (brand) of the engine used on the Canoe (s)?	What is the capacity of the engine used (Hp) on the Canoe (s)?	Did (NAME) readily get premix fuel anytime needed? 1=Yes 2=No IF Q2=1> > 15	What was the status of the Semi-industrial Vessel ownership? RECORD THE NO. OF SEMI-INDUSTRIAL VESSELS USED BY HOUSEHOLD MEMBER	What was the number of (NAME's) Semi-industrial vessel(s) registered as at December 2017?	Number of (NAME's) Semi-industrial vessel(s) embossed as at December 2017?	What is the make (brand) of the engine used on the Semi-industrial Vessel (s)?	What is the capacity of the engine used on the Semi-industrial Vessel (s)?	Which fishing gear(s) did (NAME) use in 2017? USE GEAR CODE	What was the number of fishing trips per week?	How many hours did (NAME) spend on each trip?	Did (NAME) and crew migrate to other regions to fish? 1=Yes 2=No											
																			(3)				(10)				(15)		
																			A	B	C	D	A	B	C	D	A	B	C
CAPI WILL PROVIDE	(1)	(2)	Fully Owned Hired Jointly Owned Free Use	(4)	(5)	(6)	(7)	(8)	(9)	Fully Owned Hired Jointly Free Use	(11)	(12)	(13)	(14)	Fully Owned Hired Jointly Free Use	(17)	(18)	(19)											

- GEAR CODE**
 001 Purse seine (Poli/Watsa)
 002 Hook & Line
 003 Drift Gill Net
 004 Beach Seine
 005 Ali
 006 Set Net and
 007 Cast net
 008 Nifa-nifa
 009 Atigya
 010 Bamboo
 011 Traps
 012 Other (specify)
- ENGINE MAKE**
 001 Yamaha
 002 Suzuki
 003 Johnson
 004 Tohatsu
 005 Man Diesel
 006 Sale Diesel
 007 Daihatsu
 008 Yanmar
 009 Hyundai
 010 Vehicle Engine
 011 Other (specify)
- ENGINE CAPACITY**
 001 – 4HP
 002 – 8HP
 003 – 9HP
 004 – 15HP
 005 – 25HP
 006 – 30HP
 007 – 40HP
 008 – Other (Specify)
- UNIT OF MEASUREMENT**
 001 – Pan/Basin
 002 – Basket
 003 – Bucket
 004 – Crate
 005 – Kg
 006 – Carton
 007 – Other (Specify)
- Marine Species**
 052= Anchovy
 053= Atlantic sailfish
 054= Barracuda
 055= Bigeye Fish
 056= Blue Marlin
 057= Bonito
 058= Bumper
 059= Buro
 060= Burrto
 061= Butter Fish
 062= Cassava/Croaker
 063= Crabs
 064= Decapterus (Pamplo)
 Dentex (Bala)

SECTION 7: CAPTURE FISHERIES (MARINE & INLAND FISHING) (cont'd)

[illegible]

- | | |
|-------|------------------------|
| 065= | , Yeke, Tsile) |
| 066= | Dolphin Fish |
| 067= | Drum |
| 068= | Flying Fish |
| 069= | Flying Gurnard |
| 070= | Garfish |
| 071= | Globefish |
| 072= | Grouper |
| 073= | Guitarfish |
| 074= | Halfbleak |
| 075= | Kingfish (Saffo) |
| 076= | Ladyfish/Tenpounder |
| 077= | Lobster |
| 078= | Herring |
| 079= | Mackerel (Salmon) |
| 080= | Meagre |
| 081= | Moonfish |
| 082= | Mullet |
| 083= | Palometa (Lilee) |
| 084= | Pampano (Kokobli) |
| 085= | Ray |
| 086= | Red Pandora (Yiyiwa) |
| 087= | Ribbonfish |
| 088= | Roncador |
| 089= | Sardinella |
| 090= | Sea Snail |
| 091= | Seabream (Sikasika) |
| 092= | Shad/Bonga |
| 093= | Sharks |
| 094= | Shrimps |
| 095= | Snapper |
| 096= | Soles |
| 097= | Spade Fish (Okposansa) |
| 098= | Swordfish |
| 099= | Threadfin |
| 0100= | Triggerfish |
| 0101= | Tuna |
| 0102= | Other (specify) |

Inland Species

- 024= Alestes
025= Aucheno glanis
026= Bagrus
027= Brycinus nurse
028= Chrysichthys
029= Citharinus
030= Clarias
031= Cynothrissa
032= Distichodus
033= Gymnarchus
034= Hemichromis
035= Heterotis
036= Hydrocynus
037= Labeo
038= Lates
039= Malapterurus elec.
040= Mormyridae
041= Polypterus spp
042= Sarotherodon galilaeus
043= Schilbeidae
044= Synodontis
045= Tilapia (Oreochromis)
046= Other (specify)

SECTION 8: TYPES OF TREE CROPS ON FIELD (PLOT)

Household Member ID No.	Serial number of farms (Parcels) on holding	Serial number of fields (plots) on each farm (parcel)	Total land area of this field (plot)? (1)	Type of cropping system 1= mono cropping 2= mixed cropping (2)	Type of Tree Crops produced on this field (plot) (3)	Production																What was the total cost of production in 2017					
						What was the total quantity produced and quantity sold in 2017 (SEE UNITS: IF THE RESPONDENT MENTIONED A UNIT THAT IS NOT SPECIFIED, HELP THE RESPONDENT TO CONVERT TO ONE OF THE SPECIFIED UNITS AS THE NEAREST EQUIVALENT) (4)																(5A)	(5B)				
						SEE CROP CODES. [RECORD UP TO 4 CROPS IF MIXED CROPPING]				A				B				C						D			
CAPI TO PROVIDE			Units 1 = Pole 2 = Rope 3 = Metres square 4 = Acre 5 = Hectares			A	B	C	D	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Quantity Produced	Quantity Sold	Unit of measurement	Price per Unit (GH¢)	Labour	Other input cost
			ARE A	UNIT																							

CROPS CODE
ARABLE CROPS
STARCHY STAPLE
001 Maize
002 Rice
003 Millet
004 Sorghum
005 Cassava
006 Yam
007 Cocoyam
008 Taro
009 Sweet potato
010 Plantain
PULSES / LEGUMES
011 Bambara beans
012 Cowpeas
013 Groundnuts
014 Pigeon peas
015 Soya bean
HERBS, SPICES & CONDIMENTS
016 Black pepper
017 Ginger
018 Nutmeg
019 Garlic
020 Pepper (Hot)
021 Melon Seeds (Agusi)
HORTICULTURE
022 Flowers
023 Pineapples
024 Watermelon
025 Passion Fruit
026 Sweetsop
027 Soursop
028 Butternut squash
LEAFY VEGETABLES
029 Gboma
030 Bitter leaf
031 Amaranthus
032 Spinach
033 Pumpkin leaves
034 Moringa
035 Ayoyo/ Ademe
036 Cocoyam leaves
037 Mushroom
UNITS
01 Kg
02 Tonnes
03 Mini Bag (Fertilizer bag)
04 Maxi Bags (Cocoa bag)
05 Tubers
06 Bundle/ Bunch/ Heap
07 Single Count
08 Rope
09 Pole
Units for (7)
1= bag maxi
2= bag mini
3= bowl
4= bucket
5= basket
6 =bunch
7 =tubers

SECTION 8: TYPES OF TREE CROPS ON FIELD (PLOT) cont'd

Household Member ID No.	Serial number of farms (parcels) on holding	Serial number of field (plot) on holding	What was the main purpose of producing each crop type on this field (plot) (6)	Did (NAME) use pesticide (weedicide, insecticide, fungicide, etc) on this field (plot)? (7)	Did (NAME) use fertilizer on this field (plot)? (8)	Did (NAME) have nurseries on this field (plot)? (9)	What was the main source of planting material (NAME) used for this production? (10)	Did (NAME) irrigate this field (plot)? (11)				
CAPI WILL PROVIDE			1= Own consumption only 2= Own consumption with minor sales 3= Sales only 4= Sales with minor consumption	1=Yes 2=No	1=Yes 2=No	1=Yes 2=No	1= Shop 2= Own produce 3= Gifts 4= Open market 5= Seed Production Division (COCOBOD) 6= Department of Agriculture 7= Other (specify)	1=Yes, fully controlled 2=Yes, partially controlled 3=No				
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">A</td> <td style="width: 25%;">B</td> <td style="width: 25%;">C</td> <td style="width: 25%;">D</td> </tr> </table>	A	B	C	D					
A	B	C	D									

VEGETABLES
 038 Asian vegetables
 039 Cabbage
 040 Carrots
 041 Garden eggs
 042 Lettuce
 044 Stringed Beans
 045 Okro
 046 Pepper (Sweet)
 047 Cucumber
 048 Spring Onions
 049 Tomato
 050 Onions
 051 Shallots

TREE CROPS
 052 Avocado
 053 Banana
 054 Cashew
 055 Cocoa
 056 Coconut
 057 Coffee
 058 Cola
 059 Citrus
 060 Mango
 061 Oil-palm
 062 Guava
 063 Pawpaw
 064 Shea-nut

INDUSTRIAL
 065 Citronella
 066 Cotton
 067 Jute
 068 Kenaf
 069 Rubber
 070 Sissal
 071 Sweet Berry
 072 Sugar Cane
 073 Tobacco

ORNAMENTALS
 074 Flowers
 075 Grasses
 076 Leaves
 077 Landscaping

CROPPING CODE

1= MONO
 2= MIXED

SECTION 9: BEE KEEPING

Household Member ID No.	Serial number of farms (parcels) with livestock on holding	Serial number of Bee field (plot) on holding	Type of Bee on this field (plot)	What was the main purpose of rearing this Bee on this field (plot)	What was the total number of Bee Hives at the beginning 2017 (OPENING STOCK COUNT) (RECORD THE NUMBER OF HIVES) (3)			What was the total number of Bee Hives that was added on this holding in 2017? (RECORD THE NUMBER OF HIVES) (4)			
CAPI WILL PROVIDE			(1)	(2)	Male	Female	Total	Male	Female	Total	
				1= Own consumption only 2= Own consumption with minor sales 3= Sales only 4= Sales with minor consumption							

SECTION 9: BEE KEEPING cont'd

[illegible]

CONTROL

Enumerator's Name:..... Code:

--	--	--	--

Started:

--	--	--	--	--	--	--	--

Date Completed:

--	--	--	--	--	--	--	--

Signature:.....

Supervisor's Name:.....

Code:

--	--	--

Date Checked:

--	--	--	--	--	--	--	--

Signature:.....

ANY SUPPLEMENTARY QUESTIONNAIRE USED? 1 = YES, 2 = NO

--

IF YES, INDICATE THIS QUESTIONNAIRE AS

--

OF

--

A3.2 Community questionnaire

GHANA STATISTICAL SERVICE

In collaboration with

STATISTICS, RESEARCH AND INFORMATION DIRECTORATE, MoFA



REPUBLIC OF GHANA



GSS



MoFA



FAO

CENSUS OF AGRICULTURE 2017

COMMUNITY QUESTIONNAIRE

IDENTIFICATION

REGION NAME:

CODE

DISTRICT NAME:

CODE

DISTRICT TYPE

SUB-DISTRICT

EA BASE NAME:

EA NUMBER

LOCATION OF FEATURE:

GPS coordinates of the Community	Longitude in degrees (decimal)	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Latitude in degrees (decimal)	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Altitude in metres	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Ghana Post GPS Code	

Time started (24Hrs):

Hr

--	--

Min

--	--

1. EA Code:

--	--	--	--	--	--	--	--	--	--

2. EA Type: 1= Urban
2 = Rural

--

3. Ecological Zone:

Coastal1
Forest2
Savannah.....3

--

4. Locality Name:

4a. Other Name of the Community (Locality):

5. Locality Number:

--	--	--

Date Started:

--	--	--	--	--	--	--	--

Date Completed

--	--	--	--	--	--	--	--

Supervisor's Name:

Supervisor's Code:

--	--	--

List of Community/Locality Focus Group Members

S/N	Name	Designation	Contact number
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11			
12			
13			
14			
15			
16			
17			
18			

A – SOCIO-ECONOMIC CONDITIONS

QA1. What are the 4 major economic activities of the people of this community?

Crop Farming.....1

Livestock Farming.....2

Capture Fisheries.....3

Trading.....4

Handicraft.....5

Salt Mining.....6

Commercial Mining.....7

Small Scale Mining.....8

Sand Winning.....9

Quarrying.....10

Food Processing.....11

Charcoal Burning.....12

Vocational Trade Activities (Artisans)...13

Bee keeping.....14

Aquaculture (fish farming).....15

Tree Planting.....16

Other (specify).....17

1st

2nd

3rd

4th

QA2. Does the community/locality produce enough food to sustain her population throughout the year?

(Yes=1 No =2)

QA3. Do you have any fertilizer sales point in this community? (Yes=1 No =2)

QA4. If No to QA3, what is the distance to the nearest sales point? |__||__||__|. |__|; code |__|

QA5. Do you have agrochemicals sales points in this community? (Yes=1 No =2)

Distance code

1= Km

2= Miles

3= Metres

QA6. If No to QA5, what is the distance to the nearest sales point? |__||__||__|. |__|; code |__|

QA7. Do you have improved planting material (“Agric”) sales points in this community? (Yes=1 No =2)

QA8. If No to QA7, what is the distance to the nearest sales point? |__||__||__|. |__|; code |__|

QA9. Do you have institutions that provide credit to farmers in this community? (Yes=1 No =2)

QA10. If No to QA9, what is the distance to the nearest institution? |__||__||__|. |__|; code |__|

QA11. Do you have irrigation facilities in this community? (Yes=1 No =2)

QA12. Do you have veterinary services points in this community? (Yes=1 No =2)

QA13. If No to QA12, what is the distance to the nearest veterinary service point? |__||__||__|. |__|; code |__|

QA14. Do you have agricultural extension services (private or public) in this community? (Yes=1 No =2)

QA15. Do you have periodic or permanent agricultural produce/ livestock/ fisheries market in this community?

(Yes=1 No =2)

QA16. If No to QA15, what is the distance to the nearest market, irrespective of the type of produce (crop, livestock or fisheries)? |__||__||__|. |__|; code |__|

QA17. Do you have any agricultural produce/ livestock/fisheries market buying network in this community?

(Yes=1 No =2) ☐

QA18. Do you have any commercial/ modern agricultural produce storage (Silos/ Cold Storage etc.) facilities in this community?

(Yes=1 No =2) ☐

QA19. If No to QA18, what is the distance to the nearest storage facility? ||||; code

QA20. Do you have any agricultural processing facilities in this community? (Yes=1 No =2) ☐

QA20b. If No to QA20, what is the distance to the nearest processing facility? ||||; code

QA21. Do you have agricultural mechanisation service centers in this community? (Yes=1 No =2) ☐

QA22. If No to QA21, what is the distance to the nearest service center? ||||; code

QA23. Do you have farmers' associations, cooperatives, and other bodies **providing support services** to farmers in this community, irrespective of the type of crop/livestock/fisheries? (Yes=1 No =2), If No skip to QA25 ☐

QA24. If Yes to QA23, what is their total membership?

Type	Male	Female
<i>Crop</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Livestock</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Fisheries (capture or aquaculture)</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Hunting</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Craft</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Commerce</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Processing</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Lending/borrowing clubs</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<i>Health insurance</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Folklore and cultural associations	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Tree Planting	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Multifunctional associations (specify)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

QA25. Do you have electricity in this community? (Yes=1 No =2) ☐

QA26. Do you have a radio station in this community? (Yes=1 No =2) ☐

QA27. If No to QA26, what is the distance to the nearest radio station? ||||||||||; code ||||

QA28. Do you have a community public address system? (Yes=1 No =2) ☐

QA29. Do you have telephone reception in this community? (Yes=1 No =2) ☐

QA30. If No to QA29, what is the distance to the nearest telephone reception point? ||||||||||; code ||||

QA31. Do you have access to any means of public transport (vehicle, train, boat, cart, bicycle, tricycle, motorbikes

services) to other communities? (Yes=1 No =2)

☐

QA32. If Yes to QA31, state the main means of transport?

QA33. What are the most widely used languages in this community? List up to a maximum of two

1.....| | |

2.....| | |

List of languages and their codes (Provide full list of languages in in Ghana)

Akan01

Ewe02

Ga03

Dagbani04

Hausa05

Nzema06

Gonja07

Mamprusi08

Guan09

Kasim/Nankana10

Konkomba11

Nanumba12

Buli13

Gruni14

Sisala15

Dagari/Waali16

Kusal17

Dangme18

Other19

QA34. Do you have improved livestock breeding stock sales points in this community? (Yes=1 No =2) | |

QA35. If No to QA34, what is the distance to the nearest sales point? | | | | |; code | |

QA36. Do you have fishing and aquaculture input sales point in this community? (Yes=1 No =2) | |

QA37. If No to QA36, what is the distance to the nearest sales point? | | | | |; code | |

QA38. Do you have forest tree planting material (nursery) sales point in this community? (Yes=1 No =2)
| |

QA39. If No to QA38, what is the distance to the nearest sales point? | | | | |; code | |

B. AGRO-ECOLOGICAL, TOPOGRAPHICAL, SOIL TYPES AND NATURAL DISASTERS

QB1. What is the type of topography? (Multiple choice possible)

- A. Flat land
- B. Undulating
- C. Hilly
- D. Mountainous
- E. Valley
- F. Flood plain
- G. Marshy
- H. Other (specify).....

QB2. What is the type of soil? (Multiple choice apply)

- A. *Clayey*
- B. *Sandy*
- C. *Loamy*
- D. *Silty*
- E. *Peaty*
- F. *Other (specify).....*

QB3. How many times in the past ten years did the community suffer from the following natural disasters? If frequently, code 99.

Natural Disaster	Number of times
<i>Dry spell</i>	/ _ / _ /
<i>Flooding</i>	/ _ / _ /
<i>Landslide</i>	/ _ / _ /
<i>Earthquake</i>	/ _ / _ /
<i>Coastal erosion/inundation</i>	/ _ / _ /
<i>Other (specify)</i>	/ _ / _ /

C – BASIC INFRASTRUCTURE

QC1. What is the distance to the district administration from this community?

(write 00 if it is in the community)

| _ | _ |

QC2. What is the main access route to the nearest community?

| _ |

- Road..... 1*
- Footpath 2 ⇒ to Q C4*
- Waterway 3 ⇒ to Q C4*
- Railway 4*

QC3. Is this route usable throughout the year? (Yes=1 No =2)

| _ |

QC4. How often do vehicles travel to this community?

| _ |

- Daily..... 1*
- Market days only..... 2*
- Non-market days..... 3*
- Irregularly..... 4*

QC5. What is the main source of drinking water for this community?

- Pipe borne water 01*
- Borehole/pump/tube well 02*
- Protected well 03*
- Rain water 04*
- Protected spring 05*
- Bottled water 06*
- Sachet water 07*
- Tanker supply/vendor 08*
- Unprotected well 09*
- Unprotected spring 10*
- River/stream 11*
- Dugout/pond/Lake/Dam/canal, 12*
- Other, specify:..... 13*

| _ | _ |

D – SCHOOL INFRASTRUCTURE AND TRAINING CENTRES

QD1. What is the distance from this community to the nearest

(If the infrastructure is located in the community, enter 00.0 in the appropriate boxes)

Pre-school..... /_ _ /|_|. _ / Km
 Primary school..... /_ _ /|_|. _ / Km
 Junior High School.... /_ _ /|_|. _ / Km
 SHS /_ _ /|_|. _ / Km
 Technical/Vocational..... /_ _ /|_|. _ / Km
 Tertiary..... /_ _ /|_|. _ / Km
 Literacy Centre /_ _ /|_|. _ / Km
 Reintegration and Socio-Educational Centre /_ _ /|_|. _ / Km
 Library..... /_ _ /|_|. _ / Km

E – HEALTH FACILITIES

QE1. Is there a..... in this community? (Yes=1 No =2)

Hospital |___| If no, distance (km) to the nearest Hospital /_ _ /|_|. _ /
 Clinics |___| If no, distance (km) to the nearest Clinic /_ _ /|_|. _ /

CHPS compound |___| If no, distance (km) to the nearest CHPS compound /_ _ /|_|. _ /

Pharmacy |___| If no, distance (km) to the nearest Pharmacy or store
 /_ _ /|_|. _ /

Drug/ Chemical Shop |___| If no, distance (km) to the nearest Village Pharmacy

/_ _ /|_|. _ /
 Dispensary |___| If no, distance (km) to the nearest Dispensary

/_ _ /|_|. _ /

Health center |___| If no, distance (km) to the nearest Health center

/_ _ /|_|. _ /

Maternity home |___| If no, distance (km) to the nearest Maternity home

/_ _ /|_|. _ /

Herbal Clinics/ |___| If no, distance (km) to the nearest Clinic /_ _ /|_|. _ /
 Chiropractic centre |___| If no, distance (km) to the nearest Veterinary Clinic /_ _ /|_|. _ /
 Veterinary Clinic

Veterinary Pharmacy |___| If no, distance (km) to the nearest Veterinary Pharmacy

/_ _ /|_|. _ /

Veterinary Laboratory |___| If no, distance (km) to the nearest Veterinary Laboratory

/_ _ /|_|. _ /

Slaughter house

☐ If no, distance (km) to the nearest Slaughter house /_ /_ /./_ /

Public toilet

☐ If no, distance (km) to the nearest Public toilet

/_/_/_./_ /

Discharge (garbage) point
designated by the district

☐ If no, distance (km) to the nearest point /_/_/_./_/_/

F – SOCIAL FACILITIES

QF1. Is there a..... in this community? (Yes=1 No =2)

Social center

☐ If no, distance (km) to the nearest Social center

/_/_/_./_ /

Cinema house

☐ If no, distance (km) to the nearest cinema house

/_/_/_./_ /

$$| _ _ | _ _ | _ _ | _ _ |$$
$$| _ _ | _ _ | \cdot | _ _ |$$
$$/ _ _ / _ _ / \cdot / _ _ /$$
$$/ _ _ / _ _ / \cdot / _ _ /$$
$$| _ _ | _ _ | \cdot | _ _ |$$
$$\overline{1} \quad \overline{2} \quad \overline{3} \quad \overline{4}$$

G – SOCIO-ECONOMIC INFRASTRUCTURE

QG1. Is there a..... in this community?

(Yes=1 No =2)

<i>Corn Mill</i>	<input type="checkbox"/>
<i>Flour Mill</i>	<input type="checkbox"/>
<i>Corn Huller</i>	<input type="checkbox"/>
<i>Coffee Huller</i>	<input type="checkbox"/>
<i>Rice Huller</i>	<input type="checkbox"/>
<i>Crossing Corridor of cattle</i>	<input type="checkbox"/>
<i>Store for selling pesticides</i>	<input type="checkbox"/>
<i>Storage facility for cereals/ legumes</i>	<input type="checkbox"/>
<i>Storage facility for other agricultural produce</i>	<input type="checkbox"/>
<i>Storage facility for Milk</i>	<input type="checkbox"/>
<i>Storage facility for fishery produce</i>	<input type="checkbox"/>
<i>Crop processing centre</i>	<input type="checkbox"/>
<i>Screw press</i>	<input type="checkbox"/>
<i>Fufu making machine</i>	<input type="checkbox"/>
<i>Milk processing centre</i>	<input type="checkbox"/>
<i>Marketing unit of agricultural produce</i>	<input type="checkbox"/>
<i>Marketing unit of milk</i>	<input type="checkbox"/>
<i>Marketing unit of fishery products</i>	<input type="checkbox"/>
<i>Livestock Market</i>	<input type="checkbox"/>
<i>Store for manufactured products</i>	<input type="checkbox"/>
<i>Fuel filling station</i>	<input type="checkbox"/>
<i>Fish processing plant/centre</i>	<input type="checkbox"/>

H – EXISTENCE OF MEDIA/COMMUNICATION NETWORKS

QH1, Is there a/an..... in this community? (Yes=1 No= 2)

<i>Television channel reception</i>	<input type="checkbox"/>
<i>Landline network</i>	<input type="checkbox"/>
<i>Mobile network</i>	<input type="checkbox"/>
<i>Internet Access</i>	<input type="checkbox"/>
<i>Radio Signals</i>	<input type="checkbox"/>

I – NATURAL RESOURCES OF THE COMMUNITY

Q11. Does this community have/do? (Yes= 1 No = 2)

<i>Fallow land</i>	<input type="checkbox"/>
<i>Land reserved for grazing</i>	<input type="checkbox"/>
<i>Animals in the wild</i>	<input type="checkbox"/>
<i>Ponds and rivers</i>	<input type="checkbox"/>
<i>Woodlot</i>	<input type="checkbox"/>
<i>Natural forests</i>	<input type="checkbox"/>
<i>Sacred Forests/groove</i>	<input type="checkbox"/>
<i>Mangrove</i>	<input type="checkbox"/>
<i>Protected areas (reserves)/classified forests</i>	<input type="checkbox"/>
<i>Fauna</i>	<input type="checkbox"/>
<i>Other Natural Resource (Specify)</i>	<input type="checkbox"/>

Q12. What are the endangered tree species that grow in this community?

(Yes= 1 No = 2)

<i>Teak</i>	<input type="checkbox"/>
<i>Acacia</i>	<input type="checkbox"/>
<i>Iroko</i>	<input type="checkbox"/>
<i>Mahogany</i>	<input type="checkbox"/>
<i>White wood</i>	<input type="checkbox"/>
<i>Kapok (local name)</i>	<input type="checkbox"/>
<i>Shea</i>	<input type="checkbox"/>
<i>Hlihoè (local name)</i>	<input type="checkbox"/>
<i>Anogessus (héhéti) (local name)</i>	<input type="checkbox"/>
<i>Coconut</i>	<input type="checkbox"/>
<i>Heti (local name)</i>	<input type="checkbox"/>
<i>Baobab</i>	<input type="checkbox"/>
<i>Cashew</i>	<input type="checkbox"/>
<i>Neem</i>	<input type="checkbox"/>
<i>Odum</i>	<input type="checkbox"/>
<i>Others (specify)</i>	<input type="checkbox"/>

Q13. How much does agricultural land cost (Ghana Cedi per acre; Note: 4plots = 1 acre)

Don't know= 9999; Free =0000.00

- <i>Today</i>	<input type="text"/>
- <i>1 year ago</i>	<input type="text"/>
- <i>2 years ago</i>	<input type="text"/>
- <i>3 years ago</i>	<input type="text"/>

QI4. How much does land for building cost (Ghana Cedi per plot; Note: 4 plots = 1acre)

Don't know = 9999; Free = 0000.00

- Today | | | | | | | |
- 1 year ago | | | | | | | |
- 2 years ago | | | | | | | |
- 3 years ago | | | | | | | |

Section J : SOCIO-ECONOMIC ASSOCIATIONS/ORGANISATIONS

QJ1. Are there any associations / organisations / groups only for women in this community?

If yes, how many? (If no, write 00 in the space provided)

Areas

(Yes= 1 No = 2)

Crops	_ _ If yes, how many _ _ _
Livestock	_ _ If yes, how many _ _ _
Fishing	_ _ If yes, how many _ _ _
Aquaculture	_ _ If yes, how many _ _ _
Hunting	_ _ If yes, how many _ _ _
Honey	_ _ If yes, how many _ _ _
Craft	_ _ If yes, how many _ _ _
Commerce/Trading	_ _ If yes, how many _ _ _
Processing	_ _ If yes, how many _ _ _
Lending/borrowing clubs	_ _ If yes, how many _ _ _
Health insurance	_ _ If yes, how many _ _ _
Folklore and cultural associations	_ _ If yes, how many _ _ _
Multifunctional associations (specify)	_ _ If yes, how many _ _ _

QJ2. Are there commercial farms in this community? |_|_| If yes, how many? |_|_| / |_|_| / |_|_|

(If no, write 00 in the space provided)

QJ3. Is there a/an.....in this community?

(Yes=1 No=2)

Cooperatives of agricultural production	_ _
Cooperatives rendering agricultural services	_ _
Community Development Committee	_ _
Association of Disabled People	_ _
Committee of Child Protection	_ _
Committee for Water Management	_ _
Committee for Health Management	_ _
Committee for gender promotion	_ _
Microfinance Institution	_ _
Institution of Micro-finance for women	_ _
Other (Specify)	_ _

Section K: Key Challenges to Agricultural Production and Marketing

QK1. Is any of the following factors a challenge in crop production? (1=Yes 2=No)

Insufficient agricultural land	_ _
Rural-urban migration	_ _

Lack of market for products |__|
Lack of improved or certified seed |__|
Insufficient rainfall |__|
Soil degradation |__|
Crop diseases |__|
Deforestation |__|
Straying animals |__|
Damage predators (rats, birds, termites, worms, etc.) |__|
Insufficient manpower |__|
Insect infestation |__|
Sand winning |__|
Mining |__|
Lack of tractor services |__|
Other (specify e.g. farm inputs) |__|

QK2. Is any of the following factors a challenge in livestock production? (1=Yes 2=No)

Pests of animals |__|
Epizooties(widespread disease in animals) |__|
Theft of animals |__|
Lack of pasture |__|
Conflicts with crop farmers |__|
Other (specify) |__|

QK3. Is any of the following a factor affecting the movement/marketing of agricultural produce?

(1=Yes 2=No)

Bad roads |__|
Lack of means of transportation |__|
Lack of ready market |__|
Other (specify) |__|

QK4. Is any of the following factors a challenge in aquaculture fish production? (1=Yes 2=No)

Insufficient suitable land for aquaculture |__|
Rural-urban migration |__|
Lack of market for products |__|
Lack of improved or certified seed or fingerlings |__|
Insufficient rainfall |__|
Fish Diseases |__|
Predators (e.g. snake) |__|
Lack of construction gangs |__|
Inadequate number of Fisheries Extension Agents |__|
Lack of feed |__|
Insufficient manpower |__|
Theft of fish |__|
Insufficient aquaculture input purchasing points |__|

Section L: Units of Measurement

QL1. What is the main unit of measurement for farm sizes used in this community?

- a. Metre Square
- b. Acres
- c. Rope
- d. Pole

|__|

e. Other (Specify)

QL2. If answer to QL1 is c. or d. or e. what is the equivalent measure in an acre ?

/__/_/___/_/___/_/___/.

QL3. What is the main unit of measurement for the various farm produce for the following:

TO PROVIDE DROP BOX FOR CROP CODE AS ON PAGE 8 OF CORE HOUSEHOLD QUESTIONNAIRE.

QL4. What is the equivalent weight (kilograms) of one unit of each of the units listed in QL3 in kg ?

/__/_/___/_/___/_/___/.

General observations

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Time taken to complete: Hr

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